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Regulatory Issues in the Carbon Market

The Linkage of the Emission Trading Scheme of Switzerland with the Emission Trading Scheme of the European Union

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Für Claude

Foreword

The overarching objective of this thesis is to contribute to a better understanding of regulatory issues in the carbon market with the aim to analyse the main design options, benefits and challenges of linking the European with the Swiss Emission Trading Scheme.

However, the various regulatory layers of the global carbon market render the international climate regime highly complex. Rules governing aspects of the climate regime become ever more technical and specialised, producing experts on individual topics but only very few individuals who dispose of an overall understanding of the complete picture.[1]

As JOHN KAY, a well renowned economist and columnist to the Financial Times, highlighted with regard to carbon trading: *"If you cannot explain in two or three sentences exactly why and how a new economic policy will work, you can be confident it will have unintended consequences."*[2]

In this context, this thesis was compiled with the intention to use as few sentences as necessary. At the same time, academic diligence requires to be insistent on very *"technical"* issues. Although comprehensibility was one of the guiding principles in drafting the thesis, there is no denying that emission trading is enormously complex and linking various Emission Trading Schemes only adds additional levels of complexity.

As complexity has exacerbated the financial crisis of 2008 and possibly fostered worldwide financial markets' downturn in 2011, I hope that this publication may serve to grow general understanding and awareness of emission trading as a premise for potential simplification - for the benefit of our world's climate.

This thesis was supervised by PROF. DR. ROLF H. WEBER and PROF. DR. CHRISTINE KAUFMANN. I would like to thank both of them for their valuable support, their mentoring and their professional advice. Special gratitude is also extended to PROF. DR. JOËLLE DE SÉPIBUS, University of Bern and College of Europe (Bruges), for subject-specific exchanges.

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1 YAMIN/DEPLEDGE, 2.

2 JOHN KAY, *"Why the key to carbon trading is to keep it simple",* in: Financial Times, 9 May 2006, available at <http://www.johnkay.com/2006/05/09/why-the-key-to-carbon-trading-is-to-keep-it-simple/>.

My thesis would not have come into existence without priming of DR. MONIQUE R. SIEGEL. She deserves my special thanks as well as RUEDI ENGLER, DR. CAROL FRANKLIN, DR. FRANZISKA GERSTER and RUEDI MEYER for their ongoing moral and logistical support.

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As I am writing these lines, delegations worldwide are preparing for the Conference on Climate Change in Durban beginning on 28 November 2011. In Switzerland, the newly elected Federal Assembly has the procedure for reconciling the Draft CO_2-Act versions of the two chambers on its agenda. Whatever the results of these events will be, emission trading and the linkage of Emission Trading Schemes as means to tackle climate change will certainly remain in worldwide attention.

Zurich, 14 November 2011 JACQUELINE JAKOB-GALLMANN

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Abbreviations

AAT	Assigned Amount Trading
AAU	Assigned Amount Unit
AWG-KP	Ad Hoc Working Group on Further Commitments for Annex I-Parties under the Kyoto Protocol
AWG-LCA	Ad Hoc Working Group on Long-Term Cooperative Action under the Convention
BEKB	Bernese Cantonal Bank
BSA	Burden Sharing Agreement
BTA	Border Tax Adjustment
CCS	Carbon Dioxide Capture and Storage
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFI	Court of First Instance
CH-ETS	Emission Trading Scheme of Switzerland
CHF	Swiss Franc
CHU	Swiss Emission Unit
CITL	Community Independent Transaction Log
COP	Conference of the Parties
COP/CMP	Conference of the Parties to the UNFCCC serving as the Meeting of the Parties to the Kyoto Protocol
DETEC	Department of the Environment, Transport, Energy and Communications of Switzerland
DFP	Designated Focal Point
DNA	Designated National Authority
ECJ	European Court of Justice in Luxembourg
EEA	European Economic Area
EFTA	European Free Trade Agreement
ERU	Emission Reduction Unit
ETS	Emission Trading Scheme
EUA	European Union Emission Allowance
EUAA	European Union Aviation Emission Allowance
EUR	European Union Euro
EU-ETS	Emission Trading Scheme of the European Union
FOEN	Federal Office for the Environment of Switzerland

GATT	General Agreement on Tariffs and Trade
GATS	General Agreement on Trade in Services
GHG	Greenhouse Gas
ICJ	International Court of Justice
IEA	International Energy Agency
IET	International Emission Trading
IETA	International Emission Trading Association
IPCC	Intergovernmental Panel on Climate Change
ITL	International Transaction Log
JI	Joint Implementation
JVETS	Japan's Voluntary Emission Trading Scheme
lCER	Long-term CER
LDC	Least Developed Countries
LULUCF	Land Use, Land-Use Change or/and Forestry
MEA	Multilateral Environmental Agreements
NAP	National Allocation Plan
NER	New Entrants Reserve
NSW GGAS	New South Wales Greenhouse Gas Reduction Scheme
NZD	New Zealand Dollar
OECD	Organization for Economic Co-operation and Development
REDD	Reduction Emissions from Deforestation and Degradation (new: REDD-plus)
RGGI	Regional Greenhouse Gas Initiative
RMU	Removal Unit
SFOE	Swiss Federal Office for Energy
SME	Small and Medium Enterprises
tCER	Temporary CER
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change 1992
USD	United States of America Dollar
VER	Verified Emission Unit
WMO	World Meteorological Organization
WTO	World Trade Organization

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Materials

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3.2 Ordinances

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Registry-Ordinance: Ordinance by the Department of the Environment, Transport, Energy and Communications (DETEC) of 27 September 2007 on the National Emissions Trading Registry, SR 712.2, available at <http://www.admin.ch/ch/d/as/2007/4531.pdf>

3.3 Dispatches of the Federal Council

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1 Introduction

1.1 Emission Trading to Combat Climate Change

Climate change is one of the greatest challenges of our time. In order to hold the increase in global temperature below 2 degrees Celsius as documented by the Fourth Assessment Report of the "*Intergovernmental Panel on Climate Change*" (IPCC), deep cuts in global emissions are required.[3]

The Stern Review Report on the Economics of Climate Change, released in October 2006, lists three essential elements to achieve emission reductions: carbon pricing, technology policy and the removal of barriers to behavioural change.[4] These elements are mutually reinforcing: The adequate carbon price triggers technological innovation and, consequently, contributes to behavioural change. Therefore, creating a broadly similar carbon price signal around the world as an initial step to combat climate change is an urgent priority for international co-operation.[5]

Emission trading is one of several viable options. By allowing energy-intensive sectors to trade units of CO_2 to be emitted, carbon is given a price.[6] Other ways to establish a carbon price are the broad classes of systems of taxes, subsidies and command-and-control regulatory systems.[7]

The theory of emission trading is simple. The marginal abatement costs for greenhouse gas (GHG) emissions differ largely based on where the abatement is made. As the global climate system benefits from these reductions wherever they are made, emissions should - from the point of view of economic efficiency - be reduced where such reductions are cheapest to achieve.

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3 COPENHAGEN ACCORD, paragraph 1: *"We underline that climate change is one of the greatest challenges of our time (...)"*; paragraph 2: *"We agree that deep cuts in global emissions are required (...) with a view to reduce global emissions so as to hold the increase in global temperature below 2 degrees Celsius (...)."*

4 STERN, Executive Summary, xviii.

5 STERN, Executive Summary, xxiii.

6 CONVERY/REDMOND, 88.

7 STERN, Executive Summary, xviii; METCALF/WEISBACH, 9; See also EPINEY, 244, listing additional regulatory instruments such as emission ceilings and mandatory minimal use of renewable energy.

The securitized "*emission units"*[8] may then be transferred and acquired in the carbon market tagging carbon emissions thereby with a price.

The Kyoto Protocol concluded in 1997 established an early form of GHG emission trading with a first commitment period lasting from 2008 to 2012. It entails binding reduction commitments for 39 Parties.

Other national and regional Emission Trading Schemes are established and, eventually, directly or indirectly linked to the Kyoto carbon market. The best established and largest Emission Trading Scheme worldwide is the Emission Trading Scheme of the European Union (EU-ETS). The EU-ETS would not exist if it were not for the Kyoto Protocol. It is the *"flagship measure*" by which the Member States of the EU intend to meet their obligations under the Kyoto Protocol during the first commitment period.[9] Yet, the EU-ETS exists independently of the Kyoto Protocol.[10] It was enacted before the Kyoto Protocol became legally binding in international law and it will stay operational even if there is no agreement on post-Kyoto provisions.

In 2010, the global carbon market was estimated at a market value of 142 billion USD with the EU-ETS, linked to the Kyoto carbon market by the unilateral acceptance of emission units from the Clean Development Mechanism (CDM), accounting for 84 per cent of the volume.[11]

The future of the Kyoto carbon market, however, is uncertain as the international negotiations did not produce an agreement for the time after the first commitment period of the Kyoto Protocol (the so-called "*post-Kyoto period"*). While the international approach to climate change is blocked in a diplomatic stalemate, a system of linkages of Emission Trading Schemes on regional level may help to develop the experience and mutual trust necessary

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8 "*Emission units*" are, on the one hand, accounting units which are traced and recorded through national registries. On the other hand, they are also tradable instruments representing an entitlement to release a certain quantity of greenhouse gas (GHG) emissions into the atmosphere and as such transferable under certain established conditions. This thesis generally uses the term "*emission units"* because of its all-encompassing definition. See also BUTTON, 574, referring (for the sake of simplicity) to all different units as *"carbon units"*.

9 ELLERMAN/JOSKOW, 1, referring to JOS DELBEKE (ed), *"EU Environmental Law: The EU Greenhouse Gas Emissions Trading Scheme"*, Volume IV of the EU Energy Law Series, Claeys & Casteels, Leuven Belgium, 2006.

10 ELLERMAN/JOSKOW, 1.

11 WORLD BANK, 2011, 9.

for global negotiations to succeed.[12] The linkage of the CH-ETS with the EU-ETS may be a first step demonstrating European Countries' commitment to combat climate change and, thus, increasing credibility and confidence within international negotiations.

1.2 Thesis Objectives and Outline

Emission trading was initiated as an instrument for environmental protection. By establishing a price for GHG emissions, the ultimate aim is to reduce emissions by inciting technological innovations and behavioural change. Emission trading, however, was also initiated as an instrument to reduce the costs to meet a given emission reduction target. The design of an Emission Trading Scheme therefore requires the permanent reconciliation between environmental protection and cost-reduction strategies.

Emission Trading Schemes are created by legal provisions. They are sophisticated entities, born out of a political decision to limit certain forms of polluting behaviour and coming into existence only through a regulatory framework of objectives, rules, procedures and principles.[13] Although effected emission reductions and cost-efficiency is the core interest, it is very difficult to measure the effect and to prove the consequences of regulatory regimes. Causes and effects may easily be superposed by complexity.[14] Side effects such as terms-of-trade effects or the effect of other climate change policies are omnipresent.

Still, the effectiveness of the Emission Trading Scheme may, to a large extent, depend upon the specific way in which the system has been put into a legislative framework. In that respect, particular legal aspects, for example concerning the methods of the allocation, the mechanisms to control trade or the provisions on enforcement are issues of particular importance.[15]

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12 JAFFE/RANSON/STAVINS, 803.

13 MEHLING, 111, referring to an in-depth analysis by KAROLIINA ANTTONEN/MICHAEL MEHLING/KARL UPSTON-HOOPER, *"Briefing Life into the Carbon Market: Legal Frameworks of Emissions Trading in Europe"*, in: European Environmental Law Review, Volume 16, Number 4, April 2007, 96-116.

14 WINTER, 291.

15 FAURE/PEETERS (eds), 6.

This thesis aims at providing a systematic overview of regulatory issues in the three distinct carbon markets created by provisions of the Kyoto Protocol ("*Kyoto carbon market*"), by Community-legislation in the EU and by national legislation in Switzerland. On this basis, the main design options, benefits and challenges of a linked European-Swiss Emission Trading Scheme shall be analysed.

The Kyoto Protocol affects the institutional setting for domestic Emission Trading Schemes as well as for their linkage.[16] With the acceptance of emission units from the Clean Development Mechanism and from Joint Implementation projects, significant interdependencies have been established between the Kyoto carbon market and the EU-ETS on the one hand and the Emission Trading Scheme of Switzerland (CH-ETS) on the other hand. A linkage between the EU-ETS and the CH-ETS, hence, cannot be looked at in isolation from the international emission trading framework as provided by the Kyoto Protocol.

Section 2 therefore introduces regulatory issues of the Kyoto carbon market before section 3 and 4 examine the legal design and central characteristics of the Emission Trading Schemes in the EU and in Switzerland respectively. In section 5, finally, different forms of linking and potential issues in the case of a linkage of the Emission Trading Schemes of the EU and the Emission Trading Scheme in Switzerland are discussed.

However, since the linkage of the CH-ETS and the EU-ETS is neither definitely decided nor drafted, many of the issues discussed in the concluding section of the thesis are not primarily legal issues but rather economic or policy-related. The legal provisions implementing a linkage of the EU-ETS with the CH-ETS yet have to be drafted.

1.3 Literature and Research

There is an ample literature about emission trading, most of it is written from an economic perspective.[17] The overwhelming majority of the literature on

16 BAZELMANS, 299.

17 See, for example, the important bibliography on tradable emission units compiled by TOM TIETENBERG, updated in 2008, available at <http://www.colby.edu/~thtieten/trade.html>, accessed on 14 November 2011.

emission trading has been published after the year 2000.[18] Most of the existing literature belongs to the categories context/history, allocation, emission reductions, sectoral competitiveness/carbon leakage and offsetting via the Clean Development Mechanism.[19] Yet, as MEHLING concludes, legal and normative considerations have featured only marginally in existing research on the conditions and implications of linking Emission Trading Schemes.[20] It is interesting to note that hardly any literature can be found on compliance and enforcement, neither with regard to the Kyoto carbon market nor with regard to regional Emission Trading Schemes. An explanation therefore may be that carbon markets have not experienced the phase of systematic determination of issues of non-compliance yet.

Emission trading is a very young and dynamic research field with direct interaction with the policy making process. The WORLD BANK annual reviews of the carbon market, therefore, provide a global perspective and include separate sections on regional policies where the most important facts are summarized and new developments discussed.

The European Commission and Commission staff has provided a wealth of material concerning the origins of the EU-ETS. The team led by JOS DELBEKE published a series of perspectives – legal, economic, political science, and administrative – on the evolution of the trading idea from concept to execution. Their publications are important "*insider sources"*.[21]

Whereas, for obvious reasons, the early literature was constraint to "*ex-ante"* syntheses of emission trading, a series of newer publications on the EU-ETS conducts "*ex-post"* analyses of phase I using EU data material. CONVERY/REDMOND (2007), ELLERMAN/CONVERY/DEPERTHUIS (2010), ELLERMAN/JOSKOW (2009), GRUBB ET AL. (2009) and KRUGER/OATES/PIZER (2007) are some of the existing syntheses providing a comprehensive overview and making some preliminary normative judgements. The ELLERMAN/BUCHNER contributions (2006/2007/2008), based on early statistical material, were the

18 A search of the ISI Search Engine Web of Knowledge on 11 July 2008 using the key words Europe, Emission, Trading yielded 608 documents, of which over 78 per cent appeared since 2000. CONVERY, 131.

19 CONVERY, 123, adds to the list distributional issues, new entrants, markets, finance and trading.

20 MEHLING, 111.

21 CONVERY, 123/124.

first ones to endeavour to answer the important question whether the EU-ETS in its pilot phase was able to induce emissions reductions.[22]

Literature on linking Emission Trading Schemes has experienced a boost between 2006 and 2010 when the emergence of Emission Trading Schemes in various regions of the world seemed to be realistic and transatlantic links appeared to be a promising option. An early discussion of the linkage between Emission Trading Schemes has been provided by HAITES/MULLINS (2001). Some of the publications have been commissioned by the OECD and the IEA (e.g. ELLIS/TIRPACK, 2006) and the European institutions (e.g. MACE ET AL., 2008; SCHÜLE/STERK, 2008). A growing body of research (e.g. EDENHOFER/FLACHSLAND/MARSCHINSKI 2007; FLACHSLAND, Dissertation, 2010; JAFFE/RANSON/STAVINS, 2009; MEHLING, 2009; SCHÜLE ET AL., 2006), has focused on comparing schemes by looking at the stringency of targets and timeframes, the equivalence of requirements for participating sectors, the definition of emission units, and procedural aspects such as monitoring, reporting and verification.[23]

Emission trading in Switzerland has not been in the focus yet. A part from WEBER (2008) and two studies commissioned by the Federal Administration (FIRST CLIMATE/ ECONABILITY, 2009; ECOPLAN 2010), a synthesis on the CH-ETS does not exist. In November 2010, the VEREINIGUNG FÜR UMWELTRECHT (VUR) held a seminar on climate regulation in Switzerland. Respective articles of HAUSER, KECKEIS and BALLY are the valuable contributions by Swiss climate policy practitioners.

Further upcoming areas for research are transaction costs (e.g. JARAITE/ CONVERY/DIMARIA, 2009) and the policy process in a *"second-"* or *"third-best world"* (e.g. HOLTSMARK/SOMMERVOLL, 2008). Due to increasing statistical material available, the question of scarcity-reflecting pricing and the question of economic and ecological performance of carbon markets will also attract increasing attention and have the potential to shape the political debate and the future policy making process considerably.

22 CONVERY, 134.
23 MEHLING, 110/111.

2 The International Climate Policy Framework

2.1 Introduction

The seed to what has become the Kyoto carbon market was planted with the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and was specified by its Kyoto Protocol in 1997. The so-called *"framework treaty"*[24] and its successive protocols, annexes and related agreements was, to a large extent, influenced by the work of the "*Intergovernmental Panel on Climate Change*" (IPCC), a panel established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). However, the IPCC is not formally linked with the Convention and its protocols.

The Kyoto Protocol marks a turning point in the field of international relations.[25] Whereas international relations were so far governed by the principle of sovereign equality, the Parties now agreed on the *"principle of common but differentiated responsibilities*".[26] Based on the consent that the largest share of historical and current global emissions of GHG originated in developed countries, the principle of common but differentiated responsibilities paves the way for developing countries to let their share of GHG emissions continue to grow in order to meet social and development needs.

The ways in which the mechanisms of the Kyoto carbon market would operate were negotiated after the finalization of the Kyoto Protocol by the institutional bodies created through the Convention and the Protocol. Whereas the Convention sets an objective as well as basic principles and obligations within the climate change framework, the implementation modalities for the carbon market had to be designed by decisions of subsequent Conferences of the Parties (COPs) and Conferences of the Parties to the UNFCCC serving as the Meeting of the Parties to the Kyoto Protocol (COPs/CMPs). A major

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24 In the rapidly developing field of international environmental law, framework treaties, together with the institutions they create, have become regulatory regimes. On international regimes see BIRNIE/BOYLE/REDGWELL, 84 -98.

25 VOÏNOV KOHLER, XXI.

26 Article 3, paragraph 1 UNFCCC: *"The Parties should protect the climate system (...) on the basis of equity and in accordance with their common but differentiated responsibilities (...)."*

package of measures was agreed to at COP.7 which took place in Marrakesh in November 2001 and was confirmed at COP.10/CMP.1 in Montreal in November/December 2005. However, a number of key issues still remained to be settled either through practice or by further COP/CMP decisions.[27]

The Kyoto protocol affects the institutional setting for linking domestic ETSs in two ways.[28] Firstly, it provides a framework for international emission trading, linking domestic ETSs in Annex-B Parties. Secondly, it establishes internationally agreed procedures for generating emission units according to the Clean Development Mechanism (CDM) and according to the mechanism of Joint Implementation (JI).

2.2 United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change (UNFCCC) was concluded in New York on 9 May 1992. It entered into force on 21 March 1994, the ninetieth day after the 50th ratification had been submitted, and has now 195 Parties.[29]

The basic objective of the Convention is to stabilize GHG emissions *„at a level that would prevent dangerous anthropogenic interference with the climate system".*[30] The level necessary to prevent dangerous interference is not specified in the Convention. It only stipulates that it should be "*achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.*[31] Therefore, some Parties commit themselves to reduce emissions *"with the aim of returning individually or jointly*[32] *to their 1990 levels of anthropogenic emis-*

27 FREESTONE/STRECK, 18.

28 BAZELMANS, 299.

29 Article 23, paragraph 1 UNFCCC. The status of ratification can be checked at <http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php>, accessed on 14 November 2011.

30 Article 2 UNFCCC.

31 Article 2 UNFCCC.

32 "*Individually or jointly*" - the lack of concretion left wide room for interpretation. To most negotiators and observers, this phrase primarily referred to the concept of "*Joint Implementation"*. The Member States of the EU, however, maintained that they would

sions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol".[33] The 39 Parties which commit themselves to reduce their emissions are listed in Annex I of the Convention.[34] Additionally the European Economic Community and the United States of America are listed in Annex I.

The Convention is universally accepted as the basis of the international policy on climate change. Its supreme body is the *"Conference of the Parties"* (COP).

The climate regime is a process-oriented framework, allowing successive protocols, annexes and related agreements to be negotiated, adding to or revising the initial treaty and developing and evolving the regime over time.[35] In the rapidly developing field of international environmental law, framework treaties, together with the institutions they create, have become regulatory regimes.

The Convention, however, does not create any legally-binding obligation of industrialised countries to limit GHG emissions.[36] The major importance of the Convention for the Kyoto process consists of the fact that it provided an objective as well as basic principles. Equally important, the Convention established procedures and institutions, which provided the framework for political and diplomatic activities.[37]

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be allowed under this provision to agree on an internal "*burden-sharing arrangement"*. See OBERTHÜR/OTT, 141.

33 Article 4, paragraph 2, subparagraph b UNFCCC. Hereinafter, this thesis uses the term *„greenhouse gas"* or *"GHG"* as an abbreviation for the whole phrase *„anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol"*.

34 Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland.

35 OBERTHÜR/OTT, 207.

36 The terminology has been characterised as *"the most impenetrably treaty language ever drafted"*. OBERTHÜR/OTT, 34, referring to PHILIPPE SANDS, "*The United Nations Framework Convention on Climate Change*", Review of European Community & International Law, Volume 1, 1992, 273.

37 BIRNIE/BOYLE/REDGWELL, 13, point out that by using the consensus negotiating procedure and *"package deal"* diplomacy, framework treaties are usually able to secure a

2.3 The Kyoto Protocol

The Kyoto Protocol's supreme body is the "*Conference of the Parties serving as the Meeting of the Parties*" (CMP). The sessions of the COP and the CMP are held during the same period to reduce costs and improve coordination between the Convention and the Protocol. The de-facto function as supreme body is evidenced by the broad range of functions allocated to the COP/CMP whose primary function is "*to keep under regular review*" the implementation of the Protocol and to take, within its mandate, the "*decisions necessary to promote its effective implementation*".[38]

2.3.1 The Article 3.1-Commitment

The Kyoto Protocol was adopted by the third *"Conference of the Parties*" (COP) to the Convention on 11 December 1997. With Article 3, paragraph 1 of the Kyoto Protocol *("the Article 3.1-commitment"*), binding commitments have been agreed for those Parties which are listed in Annex B of the Kyoto Protocol: *"The Parties included in Annex I* (of the Convention) *shall, individually or jointly, ensure that their*[39] *aggregate anthropogenic carbon dioxide equivalent emissions of greenhouse gases listed in Annex A* (of the Protocol) *do not exceed their assigned amounts,(...) with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012."*[40]

The reduction commitments in Annex B are differentiated and range from an obligation to reduce emissions by 8 per cent (for the EU and many Eastern European countries) to permission to increase emissions by 10 per cent (Iceland) and Australia (8 per cent).[41] The reduction commitments, listed in percents, multiplied with the verified emission of the base-year 1990 results in

general acceptance of the negotiated texts and, thereby, build the basis for subsequent developments. See also OBERTHÜR/OTT, 33.

38 Article 13, paragraph 4 of the Kyoto Protocol.

39 WINTER, 297. Before the Kyoto Protocol was drafted and ratified, *"their"* was understood as emissions in the territory of each individual signatory of the UNFCCC.

40 Article 3, paragraph 1 of the Kyoto Protocol. 2008 to 2012 is, hence, referred to as first *Kyoto commitment period*. However, no decision has been taken on the *post-Kyoto period* yet.

41 See also OBERTHÜR/OTT, 121-123.

the *"assigned amount*" of each Annex B-Party.[42] The targets apply to six of the most important anthropogenic greenhouse gases, all of which are listed in Annex A of the Kyoto Protocol.

Being one of the most ambitious treaties ever adopted, much of the Kyoto Protocol's content represents *"unfinished business*":[43] *"The Kyoto Protocol was not designed to solve the problems of climate change; rather it was designed to set in motion a process by which the major economies of the developed world would begin to address in a meaningful way the means and modalities of radically reducing their carbon footprint."*[44]

2.3.2 Annex B-Parties

Annex B of the Kyoto Protocol contains the same 39 countries as the Annex I of the Convention does, in addition also the USA.[45] In 2001, however, the USA pulled out of the process and refused to ratify the Kyoto Protocol. Thus, the USA (although Party to the Convention) have to be considered outside of the Kyoto system. All other signatories to the Protocol are referred to as Non-Annex B-Parties. Non-Annex B-Parties are, without exception, countries of the developing world. They do not have any mandatory emission reduction targets.

In order to enter into force, the Kyoto Protocol required ratification by 55 Parties to the Convention including ratification by Annex I-Parties *"which accounted in total for at least 55 per cent of the total carbon dioxide emissions for 1990 of the Parties included in Annex I"*.[46] After the withdrawal of the USA from Kyoto in 2001, virtually all the other Annex I-Parties had to ratify the Protocol in order to bring it into force. On 16 February 2005, after the Russian Federation had ratified the Protocol, it came into force.

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42 In practical terms, the assigned amount is the total amount of *"Assigned Amount Units"* (AAU) or the *„AAU budget"* at a Party's disposal.

43 OBERTHÜR/OTT, 95.

44 FREESTONE/STRECK , 4.

45 The Protocol itself refers to Annex I-Parties when addressing Parties with an Article 3.1-commitment. This thesis generally uses the term Annex B-Parties. It only uses the term Annex I-Parties in citation of sources which use the term Annex I-Party for Parties with an Article 3.1-commitment.

46 Article 25, paragraph 1 of the Kyoto Protocol.

Each Annex B-Party must cover its emissions by an equivalent amount of "*Kyoto emission units"*, the *"currency"* of the Kyoto carbon market.[47] The Kyoto emission units are, on the one hand, accounting units which are traced and recorded through national registries. On the other hand, they are also tradable instruments representing an entitlement to release a certain quantity of GHG emissions into the atmosphere and are as such transferable under certain established conditions.[48]

The way to achieve compliance with its Kyoto commitment and how to get a sufficient amount of Kyoto emission units to cover its emission is up to each Annex B-Party.[49] Annex B-Parties may set emissions obligations to be reached by the entities through a system of emission trading. If and to what extent the Annex B-Parties integrate their scheme into the international emission trading structure and link it to other schemes is up to the Annex B-Parties.[50]

Administrative support for the functioning of the Protocol and its bodies is provided by a "*Secretariat to the Conference*" that was initially located in Geneva, and then moved to Bonn in 1996.[51] One of the secretariat's most important functions is the maintenance of the registries for the issuance of the various forms of emission units.

2.4 The Kyoto Carbon Market

The Kyoto Protocol introduces the so-called "*market-based*" or "*flexible mechanisms*" enabling Parties to achieve the committed reduction targets where it is cheapest to do so. The flexible mechanisms of the Kyoto Protocol combine the two differing flexibility concepts of "*cap-and-trade*" and "*base-*

47 Emission Reduction Units (ERUs), Certified Emission Reductions (CERs), Assigned Amount Units (AAUs) and Removal Units (RMUs). To be added to the list must be long-term CERs (lCERs) und temporary CERs (tCERs) which apply to emission reductions achieved with CDM-projects through carbon sinks.

48 The legal nature and characteristics of emission units are ambiguous and widely disputed. For a summary of the discussion see WEMAERE/STRECK/CHAGAS, chapter 3.1. *"The ethical dimension"*, 37-40; See also BUTTON.

49 A part from emission trading, other instruments to reduce GHG emissions may be taxes, charges and subsidies among others.

50 BAZELMANS, 300.

51 Article 8 UNFCCC.

line-and-credit" systems.[52] Whereas the *"Assigned Amount Trading"* (AAT) under Article 17 of the Kyoto Protocol is a cap-and-trade system, the "*Joint Implementation*" mechanism (JI) under Article 6 of the Kyoto Protocol and the "*Clean Development Mechanism*" (CDM) under Article 12 of the Kyoto Protocol are baseline-and-credit systems:

- In a cap-and-trade system, a maximal level (a *"cap"*) is agreed beforehand. The subsequent *"trade"* allows Parties to meet their targeted cap by acquiring and transferring GHG emission units from and to other Parties.[53]
- In a baseline-and-credit system, an initial baseline is established by calculation of the amount of emissions that would occur in the absence of the project (the "*business-as-usual scenario*"). The difference between this baseline and the effected (lower) emissions as a result of the project is converted into tradable emission units.[54]

The emission units generated through JI and CDM are often referred to as "*credits"*. They stand for a "*credit to emit"* resulting from the difference between the baseline and the effected lower emission which is a "*debit"* from a project elsewhere.[55]

2.4.1 "*The Currency*"

As set forth in Annex A, the Kyoto Protocol regulates emissions for six of the most important anthropogenic greenhouse gases.[56] As these gases differ with respect to their radiative forcing and their mean retention period in the atmosphere, their comparability with respect to their climate impact needs to be assured. All tradable emission units defined by the Kyoto Protocol have

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52 SIMONETTI/DE WITT WIJNEN, 159.

53 Key element in a cap-and-trade system is the procedure in which emission units are allocated. See WEMAERE/STRECK/CHAGAS, 41.

54 SIMONETTI/DE WITT WIJNEN, 159.

55 This thesis generally uses the term "*emission units"* because of its all-encompassing definition.

56 These gases are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. Article 3, paragraph 7 of the Kyoto Protocol sets 1990 as the general base-year for the calculation. Article 3, paragraph 8 of the Kyoto Protocol provides for a deflection of the general base-year 1990 and defines 1995 as the base-year for the calculation of the emission limitations for each Party for the latter three gases.

the same unit of *"one metric tonne of carbon dioxide equivalent",* translated into "*CO_2 equivalent"* or, in short, "*CO_2e"*.[57]

The emission units are differentiated according to their origin:

- An "*emission reduction unit*" (ERU) is an unit generated by a *"Joint Implementation"* (JI)-project;[58]
- A "*certified emission reduction"* (CER) is an unit generated by a Clean Development Mechanism (CDM)-project;[59]
- An "*assigned amount unit"* (AAU) is an unit issued through the calculation of each Party's assigned amount;
- A "*removal unit"* (RMU) is an unit equivalent to the net *removals* of anthropogenic greenhouse gases resulting from activities under Article 3, paragraph 3 of the Kyoto Protocol and its elected activities under Article 4, paragraph 4.[60]

The legal character of an emission unit is disputed.[61] There is a tendency for emission units to be treated as commodities which can be sold through spot trades for immediate delivery, or through futures contracts, pursuant to which emission units are delivered at a set price at a future date.[62] Distinguishing characteristics of emission units as a commodity would be the equivalence of the various emission units. However, emission units are not equivalent throughout the market. Therefore, the argument has been made that emission units present clear currency-like characteristics, similar to a monetary instrument.[63] The currency approach would overcome a problem

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57 Paragraph 1, annex to decision 3/CMP.1; paragraph 1, annex to decision 9/CMP.1; paragraph 1, annex to decision 11/CMP.1; and paragraph 1, annex to decision 13/CMP.1. Each gas has a certain rating based on its power to accelerate global warming, calculated using the global warming potentials rating index that has been provided by the IPCC in its second assessment report of 1995. Decision 2/CP.3, paragraph 3.

58 An ERU represents a credit.

59 A CER represents a credit.

60 Paragraph 25, annex to decision 13/CMP.1. A "*removal unit*" is issued on the basis of land use, land-use change and forestry (LULUCF) activities which employ the use of *"sinks"* or any process that removes GHG from the atmosphere. Forests as sinks do not constitute a permanent GHG-sequestration. With deforestation, GHG is re-emitted. Therefore, slightly special accounting rules are applied for RMUs.

61 See BUTTON; KÜLL; WEMAERE/STRECK/CHAGAS.

62 BUTTON, 576.

63 BUTTON, 587.

of not-equivalence of various types of emission units, while ensuring a liquid market for emission units.[64]

Clear decisions on the nature and the treatment of emission units would be important to give legal security and certainty to both Governments and private entities. In a linked carbon market, difference in treatment of emission units can make one sub-market of the overall system more attractive than others. Different treatment can lead to distortions of the market.[65]

2.4.2 Cap-and-Trade: Assigned Amount Trading (AAT)

The *"Assigned Amount Trading"* according to Article 17 of the Kyoto Protocol forms the basis for a global emission trading system among Annex B-Parties. The mechanism under Article 17 of the Kyoto Protocol is often referred to as "*International Emission Trading"* (IET). [66] The AAT covers not only the transfer of AAUs but the international transfer of all Kyoto emission units.

The *"assigned amount"* indicates the total quantity of emissions which an Annex B-Party is entitled to effect over a period. In practical terms, the assigned amount is the total amount of AAUs or the *„AAU budget"* at a Party's disposal. For each verified emission unit of the commitment period, one AAU must be invalidated. The unused (in other terms: not invalidated) AAUs of a commitment period can be transferred to another Annex B-Party. Likewise, not invalidated AAUs can be purchased from another Annex B-Party. (Figure 1)

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64 See BUTTON, 583-595.

65 WEMAERE/STRECK/CHAGAS, 36.

66 The often used term *"emission trading"* under the international climate change framework is somewhat misleading. Strictly speaking, Article 17 of the Kyoto Protocol is not about trading but only about transferring. Trading is buying and selling, whereas transferring is delivering/accepting the sold/bought assets. See SIMONETTI/DE WITT WIJNEN, 157/158. Paragraph 2, annex to decision 11/CMP.1 corrects this imperfection in Article 17, as it uses the phrase *"transfer and/or acquire"* rather than *"trade"*. May this imply the intention of the negotiators to limit the buying and selling of emission units and if so, how is the limit defined?

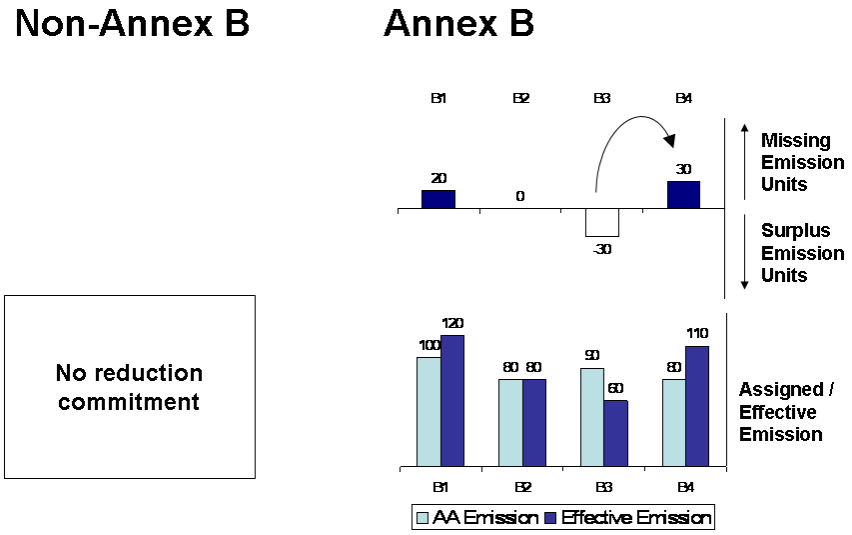

Figure 1: Assigned Amount Trading within Annex B
For each verified emission unit of the commitment period, one AAU must be invalidated.

Not only Annex B-Parties but also legal entities authorized to do so by a Party to the Kyoto Protocol can transfer Kyoto emission units.[67] But if such trade leads to a transfer according to Article 17, such transfer can only be done by Parties to the Kyoto Protocol.[68] Each Party must maintain an up-to-date list of the legal entities authorized to participate and make such lists publicly available.[69]

67 The Kyoto Protocol does not mention private entities under Article 17. But paragraph 5, annex to decision 11/CMP.1 provides that a Party that authorizes legal entities to transfer and/or acquire emission units under Article 17 will remain responsible for the fulfilment of its obligation under the Kyoto Protocol and must ensure that such participation is consistent with the applicable rules.

68 SIMONETTI/DE WITT WIJNEN, 162.

69 However, in practice no such lists are existent. See SIMONETTI/DE WITT WIJNEN, 161, Fn. 16.

2.4.3 Baseline-and-Credit: Joint Implementation (JI) and Clean Development Mechanism (CDM)

In a baseline-and-credit system, an initial baseline is established by calculation of the amount of emissions that would occur in the absence of the project (the "*business-as-usual scenario*".) The difference between this baseline and the effected (lower) emissions as a result of the project is converted into tradable emission units.[70] Under JI according to Article 6 of the Kyoto Protocol and under CDM according to Article 12 of the Kyoto Protocol, emission units can be earned by participation in emission reduction projects beyond national borders:

- The Joint Implementation (JI)[71] under Article 6 of the Kyoto Protocol allows any Annex I-Party[72] to transfer to, or acquire from, another Annex I-Party, reductions of GHG emissions.
- The Clean Development Mechanisms (CDM) under Article 12 of the Kyoto Protocol is designed with the dual aim of helping developing countries in achieving sustainable development on the one side and of assisting industrialized countries in achieving compliance with Annex B-target on the other side.[73] It allows industrialized Parties to achieve a portion of the required emission reductions in countries without targets (Non-Annex B-Parties) where reductions cost less.[74] A secondary objective was to foster climate change awareness in as many states as possible.

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70 SIMONETTI/DE WITT WIJNEN, 159.

71 The term Joint Implementation itself is not mentioned anywhere in the Kyoto Protocol, but Article 6 of the Kyoto Protocol establishes the basis for what has become known as *"Joint Implementation"*.

72 The term *"Annex I-Party"* (to the Convention) is used in Article 6 of the Kyoto Protocol meaning thereby the "*Annex B-Parties*" (to the Protocol).

73 Shortly before the Kyoto COP, Brazil tabled a proposal regarding the establishment of a *"Clean Development Fund"* financed by contributions from non-compliant Annex B-Parties. The United States welcomed the Brazilian proposal, as it saw the opportunity to both link the proposal with an increased flexibility in meeting the emission limitation targets and involve developing countries in the mitigation measures under the Protocol. STRECK (2004), 301. See also DE SÉPIBUS, Environmental Integrity, 2009, 4.

74 Article 12 of the Kyoto Protocol.

For emission units generated by a project of one of the baseline-and-credit mechanisms, the term "*credit"* or, synonymously, the term "*offset"* is usually used.[75]

With 3556 registered CDM-projects[76] and only some 492 JI-projects[77] by July 2011, the JI-mechanism may be described as a "*wallflower*".[78] The disparity in the numbers between JI and CDM projects is partially attributable to the fact that the CDM enjoyed a "*prompt start"* authorized by Article 12 of the Kyoto Protocol which allowed the registration of projects starting in 2001, four years before the Kyoto Protocol's entry into force. This means that CERs obtained during the time between 2000 and 2008 can be used to assist in achieving compliance during the first Kyoto commitment period 2008 to 2012. JI, on contrary, can only generate ERUs during the first commitment period, namely between 2008 and 2012.[79]

Due to the prompt start of the CDM, detailed modalities governing the CDM have already been provided by the Marrakesh Accords in November 2001.[80] The text regarding JI included in the Marrakesh Accords is, compared to the CDM modalities, vague and incomplete.[81] Many of the rules guiding JI have been established relatively recently.

ERUs must be converted into AAUs through the express approval of both the Annex B-Parties acting as transferor and transferees.[82] The transfer of the ERUs is then a transfer of AAUs from the host country's AAU budget into the acquiring Party's AAU budget.

CERs are not converted into AAUs. The transferring country is not an Annex B-Party and, therefore, has no reduction commitment resulting in an assigned amount of emission units. The acquiring Party, on the other side, has committed to reduce emissions and, therefore, has an assigned amount of emission units at its disposal. However, the assigned amount of the acquiring

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75 "*To offset"* is to compensate for GHG emission occurring in the regulatory entity by acquiring emission units which certify the reduction, removal, or avoidance of GHG emissions by a project outside of the regulatory entity.

76 <http://cdmpipeline.org/overview.htm>, accessed on 14 November 2011.

77 <http://cdmpipeline.org/ji-projects.htm>, accessed on 14 November 2011.

78 HOOGZAAD/STRECK, 177.

79 HOOGZAAD/STRECK, 184.

80 See decision 17/CP.7, with annexed draft decision -/CMP.1. Since the Kyoto Protocol was not in force yet, no decision by the CMP could have been taken at the time.

81 See decision 17/CP.7, with annexed draft decision -/CMP.1.

82 Article 6, paragraph 1, subparagraph a of the Kyoto Protocol.

Party remains unchanged while invalidating CERs in accounting for verified emissions. In other words, verified emissions are covered by invalidated emission units (CER) but the AAU budget of the acquiring Party remains as elevated as before. (Figure 2) Consequently, CERs enlarge the over-all cap of the Annex B-world.

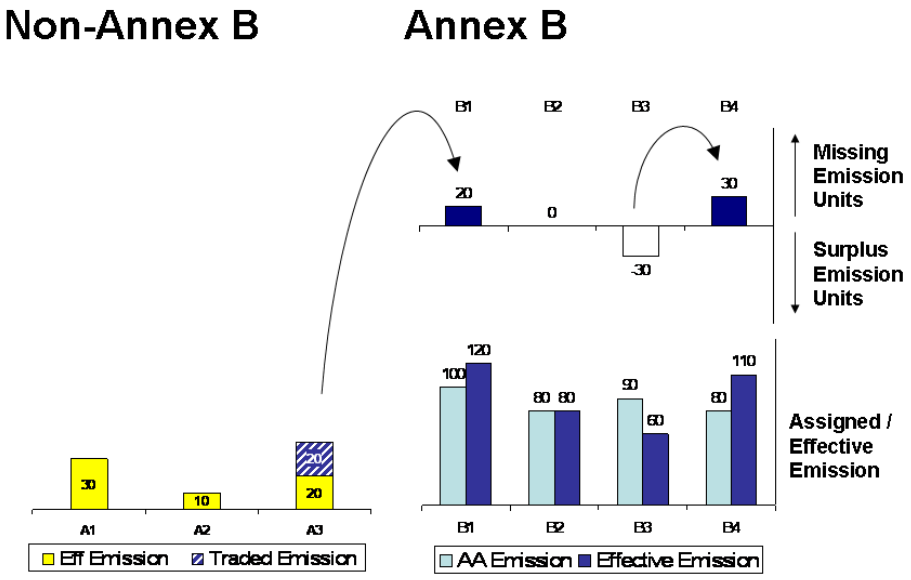

Figure 2: CDM: Purchasing CER from Non-Annex B
20 CERs free up 20 AAUs leaving the Party of the installation that bought 20 CERs with 20 spare AAUs entitling to emit 20 extra tonnes of CO_2e.

The CDM has been subject to a lot of research and critical literature.[83] The issues are, firstly, its onerous administrative requirements and the complex procedures. The governance structures established by the Kyoto Protocol create a high regulatory barrier to entering the CDM market.[84] The regula-

83 For an overview of the literature see PAULSSON and also MICHAELOWA/MICHAELOWA, OLSEN, and PEARSON.

84 Robust regulation resulting in complex procedures is necessary in order to protect the CDM from abuse and fraud. Regulatory intervention, however, has drawbacks, as it may erect barriers to entering the CDM market. Consequently, the process of issuing CERs must be examined carefully in view of the need to balance divergent interests. Only in this way may regulators determine the optimal amount of regulation. For a compact summary of the problematic see WEBER/DARBELLAY, 277-281. For practical examples see MICHAELOWA, 22/23.

tory process thus may not lead to the selection of the best CDM projects. Indeed, projects which really need the carbon payments to overcome hurdles are more likely to fail as a result of regulatory delays than are projects that are not as reliant on carbon payments for their construction and implementation.[85]

Secondly, the criticism targets the environmental integrity of the CDM and questions the capacity to produce real, measurable and long-term benefits regarding the mitigation of climate change as required in the Kyoto Protocol.[86] Because the CDM program intends to reduce emissions on a global scale, the environmental integrity of the CDM is only preserved if CERs are given exclusively to projects that would not have been developed but for the CDM.[87] Only if a project is implemented "*in-addition-to-what-would-have-been-done*" ("*additionality*") without the CDM, the project contributes to a global net reduction of GHG emissions.

From a perspective of international law, thirdly, the concept is questionable, because Article 3 of the Kyoto Protocol asks Annex-I Parties to reduce *"their"* emissions.[88] Before the Kyoto Protocol was drafted and ratified, *"their"* was understood as emissions in the territory of each individual signatory of the UNFCCC.

Another fundamental point of contention, fourthly, involves the geographical distribution of CDM projects. The biggest host countries are Brazil, China, India, Mexico and South Korea with about 77 per cent in terms of project numbers and 84 per cent as regards the expected volume of certificates.[89] A small group of South East Asian and Latin American states have more than

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85 WEBER/DARBELLAY, 281, referring to WORLD BANK, 2008, 5.

86 Article 12, Paragraph 5, subparagraph b of the Kyoto Protocol. The environmental integrity of JI, in contrary, is less of an issue because ERUs are technically not offsetting any emissions. See HOOGZAAD/STRECK, 185, describing emission units generated by JI as *"AAUs in disguise"*.

87 WEBER/DARBELLAY, 281, referring to SANDRA GREINER/AXEL MICHAELOWA, "*Defining Investment Additionality for CDM Projects – Practical Approaches"*, in: Energy Policy, Volume 31, Number 10, 2003, 1007-1015, 1007.

88 WINTER, 296/7, describing the concept as economically comprehensible, but ecologically fatal.

89 WUPPERTAL INSTITUTE, *"CDM Market still undeveloped: Only industrialized Nations can improve geographical distribution*", JIKO Analysis, Volume 4, 2009, 5, available at <http://www.jiko-bmu.de/files/basisinformationen/application/pdf/jiko_info_4_2009_e.pdf>.

25 projects each.[90] Another group of countries hosts between 10 and 20 projects each.[91] But there is a striking lack of CDM projects in Sub-Saharan Africa.

2.4.4 Supplementarity and Additionality

Supplementarity and additionality are key concepts for an environmentally effective and well-functioning carbon market. They are of high political relevance. Without adequate regulation on these issues, emission trading will not mitigate climate change.

In practice, however, they are difficult to incorporate into clear and justiciable legal provisions. Article 17 of the Kyoto Protocol asks for supplementarity, the requirement that emission reduction targets should be achieved primarily through domestic measures.[92] Supplementarity is intended to preclude countries and companies from counting on the CDM to bypass their reduction targets.[93] In 2001, at COP.7 in Marrakesh, the requirement to reduce emissions "*primarily through domestic measures*" was softened. The Marrakesh Accords ended up by stipulating that domestic actions "*shall constitute a significant element of the effort"* made by Parties included in Annex B.[94]

WEBER/DARBELLAY draw the attention to the fact that limiting the demand for CERs by supplementarity requirements makes price discovery mechanisms in the CDM market less efficient. CER prices cannot fully reflect the market conditions if the demand side is capped. They warn that establishing a supplementarity requirement can be counterproductive if demand results in

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90 This group includes Indonesia, Malaysia, Philippines, Thailand and Vietnam, along with Chile and Colombia.

91 Among these countries are Pakistan, Sri Lanka, Argentina, Ecuador, Honduras, Panama, Peru, Kenya, South Africa and Israel.

92 BODANSKY, 2. Supplementarity was promoted especially by the EU, whereas the United States of America (together with Australia and Japan) have pushed for the unrestricted use of the market-based mechanisms.

93 WEBER/DARBELLAY, 283, referring to ERICH VRANES, "*Climate Change and the WTO: EU Emission Trading and the WTO Disciplines on Trade in Goods, Services and Investment Protection*", in: Journal of World Trade, Volume 43, Number 4, 2009, 707-735, 710.

94 Decision 15/CP.7, confirmed in decision 2/CMP.1, paragraph 1. The interpretations of *"significant"* may, however, differ significantly from Party to Party.

CER prices remaining artificially low. Consequently, CERs do not remain fully competitive with other emission units.[95]

As WEBER/DARBELLAY suggest, supplementarity may to a certain extent be described as a protectionist measure of a government to privilege its own emission units. As a counter-argument, however, it may be argued that the net reduction of emissions is a constitutional requirement for the protection of population and health.[96] Given the doubts on emission reductions by CDM-projects to result in global net reductions, a potential negligence to provide for supplementarity may also be considered to be a breach of constitutional requirements.

The second key concept in the carbon market, the requirement of additionality, ensures that a project is implemented in addition to what would have been done without the flexible mechanisms.[97] Additionality, hence, signifies that the credited reductions would not have taken place for other reasons thereby requiring the prove of a counterfact ("*what-would-have-been-if-not"*). Therefore, the criteria of additionality requires the prove of more *"climate-friendliness"* than a reference project.[98] Additionality is a requirement for both baseline-and-credit mechanisms.[99]

Additionality is crucial within the CDM because there is a serious asymmetry in the concept of the CDM: CERs may be accounted by the purchasing installation in an Annex B-Party and, hence, contribute to reach the reduction target of this specific installation in an Annex B-Party. But it does so without

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95 WEBER/DARBELLAY, 283.

96 Switzerland's CO_2-Act, e.g., is an answer to the requirements in Article 74, paragraphs 1 and 2 of the Constitution of Switzerland, to protect the population and its natural environment according to the polluter-pays principle. Likewise, Article 174, paragraph 1 of the EC-Treaty provides that the Community policy contributes to the preservation, protection and improvement of the environmental quality, the protection of human health and the prudent and rational utilisation of natural resources. Article 174, paragraph 2 of the EC-Treaty demands that the community policy shall be based on the principle that environmental damage should be rectified at source and that the polluter pays.

97 For a description of additionality see WEBER/DARBELLAY, 281.

98 WINTER, 297, highlights that so-called reference projects are often of very low standard which makes the prove of additionality of the CDM-project easy. To counter this issue, some certification methodologies ask for the prove of "*financial additionality*": A project is considered to be additional when only the income from the sale of emission units makes the project profitable.

99 Article 6, paragraph 1, subparagraph b of the Kyoto Protocol for JI; Article 12, Paragraph 5, subparagraph c of the Kyoto Protocol for CDM.

altering this Party's AAU budget because CERs are produced in host countries with no AAU budget (Non-Annex B-Party). Hence, the production and transfer of CERs does not correspond to a transfer of an assigned amount because the host country of the CDM project is not an Annex B-Party and has no AAU budget at disposal. Consequently, each CER imported into the Annex B-registries represents an increase of the overall emission cap of Annex B-Parties. Therefore, the concept of additionality plays a decisive role within the CDM. Unless a CDM project is truly additional, the mechanism does not contribute to worldwide net emission reduction. To the contrary: A CER frees up an AAU leaving the Party of the installation that bought a CER with one spare AAU entitling to emit an extra tonne of CO_2e.

Although additionality seems to be an adequate criterion that provides credibility to the project-based system, concerns have been raised about the difficulties of enforcing this requirement in practice. The estimation of emission reductions poses practical problems and to prove that emissions have been reduced beyond a business-as-usual scenario is challenging.[100] From an entrepreneurial perspective and in an atmosphere of high uncertainty with regard to emission trading, it is hardly defensible to promote a project based on the assumption that only the sale of emission unit will allow the project to be profitable.[101]

2.4.5 Governance Issues of the Kyoto Carbon Market

The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) has recognized the importance of a strong compliance regime in maintaining the environmental integrity of the Kyoto Protocol: "*[E]nvironmental integrity is to be achieved through sound modalities, rules and guidelines for the mechanisms, sound and strong principles (...) and a strong compliance regime"*.[102]

The compliance system forms an integral part of the governance system of the Kyoto Protocol. It provides for an unprecedented administrative review and the experience gained from its operation since 2006 constitutes a landmark in international climate policy.[103] Supporters of the Protocol highlight

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100 WEBER/DARBELLAY, 281/282.

101 On how the regulatory barriers to entering the CDM market may work against the goal of additionality see WEBER/DARBELLAY, 282.

102 Fifth preambular paragraph of decision 2/CMP. See also MANGUIAT, 408.

103 OBERTHÜR/LEFEBER, 134.

the fact that it represents the only legally binding international instrument to limit emissions. On closer examination, however, the consequences of compliance or non-compliance with commitments are less clear-cut than one might imagine.[104]

Important elements of a carbon market's governance system are the rules for transferring and surrendering emission units, the provisions regarding reporting and reviewing and the issues of non-compliance and its consequences. Measurement, reporting and verification (MRV) provide important input to, and themselves benefit from, the compliance system.[105]

2.4.5.1 Temporal Flexibility

An Annex B-Party is compliant with the provisions of the Kyoto Protocol when for each verified emission within a given period a corresponding emission unit is invalidated. Moreover, unused emission units can be "*banked*": Surplus ERUs, CERs and AAUs, may be carried forward into the subsequent commitment period for compliance purposes.[106] The RMUs may not be carried-over.[107]

2.4.5.2 National Registries, CDM Registry and the International Transaction Log (ITL)

All units, the Kyoto units as well as European or Swiss Units, exist exclusively unchartered and in electronic form. Every transaction, hence, must be recorded in a registry. A national registry is responsible for ensuring the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and retirement of emission reduction units.[108] The registries centralize the accounting data, provide transparent monitoring of reductions, and track transactions to avoid the double counting of reductions. They provide assur-

104 TORNEY/FUJIWARA, 1.

105 OBERTHÜR/LEFEBER, 152.

106 Article 3, paragraph 13 of the Kyoto Protocol provides for the general carry-over. Paragraph 15, annex to decision 13/CMP.1 specifies the carry-over for ERUs, CERs and AAUs.

107 Paragraph 16, annex to decision 13/CMP.1.

108 The requirements for *"national registries*" are listed in paragraphs 17-48, annex of decision 13/CMP.1.

ances that reductions are maintained over time and are not sold more than once through transparent reporting and tracking of reductions.[109]

Two types of registries are implemented: (1) Governments of the 39 Annex B-Parties run national registries, containing accounts within which units are held in the name of the government or in the name of legal entities authorized by the government; (2) As the certificates stemming from CDM projects are not generated within Annex B-Parties, national registries are not suitable to account for newly issued CERs. Hence, the so-called CDM Registry was put in place under the responsibility of the CDM Executive Board and administered by the UNFCCC secretariat.[110]

All transactions within the national registries and the CDM Registry are recorded through the "*International Transaction Log*" (ITL)[111] which is established and maintained by the UNFCCC secretariat. The ITL verifies registry transactions in real time to ensure that they are consistent with rules agreed under the Kyoto Protocol. Eligibility[112] of the Party involved in the transaction to participate in the mechanisms is one of the conditions required for the ITL to clear transfers between registries.[113] The ITL requires registries to terminate transactions that are found to infringe upon the Kyoto rules.

Similar to the registries, the ITL is implemented in the form of a standardized electronic database. The principal function of the ITL is to verify the validity of transactions of Kyoto emission units as they are proposed by the Annex B-Parties.

All transfers, including transfers initiated by legal entities which have been authorized to participate in AAT, are made through the national registries of the relevant Annex B-Parties. A participating legal entity will therefore need to have an account in the national registry of the relevant authorizing Annex B-Party.

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109 PASSERO, 523.

110 Decision 3/CMP.1, appendix D.

111 Established pursuant to paragraph 38, annex to decision 13/CMP.1.

112 Eligibility is determined through the application of six criteria. One of these is to have in place a National Registry. Paragraph 31, annex to decision 3/CMP.1 (with regard to CDM); paragraph 21, annex to decision 9/CMP.1 (with regard to JI); paragraph 2, annex to decision 11/CMP.1 (with regard to AAT).

113 Paragraph 42, subparagraph b, annex to decision 13/CMP.1.

2.4.5.3 Issues of Non-Compliance

The basic institution of the Kyoto compliance regime is the compliance committee.[114] It consists of two branches: the facilitative branch and the enforcement branch. The facilitative branch, on the one side, represents a cooperative approach to compliance. With the aim of promoting compliance and providing for early warning of potential non-compliance, the facilitative branch is responsible for providing advice and facilitation and, thereby, resumes the function of an early-warning of potential non-compliance with regard to Annex B-Parties. The enforcement branch, on the other side, is responsible for the determination of non-compliance. It decides on the consequences of non-compliance.

According to the negotiations in Marrakesh and confirmed by CMP.1 in Montreal, there are three main issues of non-compliance by Annex B-Parties in the Kyoto framework:

a) non-compliance with its quantified emissions limitation or reduction obligation under the Article 3.1-commitment;
b) non-compliance with the methodological and reporting requirements under Article 5, paragraphs 1 and 2, and Article 7, paragraphs 1 and 4, of the Kyoto Protocol; and
c) non-compliance with the eligibility requirements under the three market-based mechanisms.[115]

Each of these issues of non-compliance entails specific consequences.[116]

The most relevant issues of non-compliance is the non-fulfilment of a Party's reduction commitment. This issue arises, of course, only after the end of the commitment period. The issue of compliance with emission targets for the first commitment period is unlikely to be raised before July 2015.[117]

An Annex B-Party which does not fulfil its reduction commitment will have to face a deduction from the Party's assigned amount for the second com-

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114 For a detailed description of the compliance committee and its four years of experience see the Article of OBERTHÜR/LEFEBER, 133-158.

115 Paragraph 4, subparagraphs a-c, section V, annex to decision 27/CMP.1.

116 These consequences are, for example, the declaration of non-compliance by the compliance committee, the suspension of eligibility of the Party in question, the requirement to develop a plan, in order to remedy the non-compliance and a timetable for implementing measures. Paragraphs 1-4, section XV, annex to decision 27/CMP.1.

117 TORNEY/FUJIWARA, 5. The timeframe leading to decisions over compliance is outlined in OBERTHÜR/ LEFEBER, 149.

mitment period of a number of tonnes equal to 1.3 times the amount in tonnes of excess emissions.[118] The non-compliant Party has to develop a compliance action plan[119] and faces the suspension of the eligibility to make transfers under Article 17 of the Protocol until the Party is reinstated.[120]

The problem is that if there is no agreement on commitments for the next period, the deduction approach will not be enforceable – because the substantive deduction of tonnes of a Party's assigned amount in a subsequent commitment period does not hurt if there is no subsequent period.

An additional hurdle is the fact that a Party's assigned amount would probably need an amendment of the Kyoto Protocol according to Article 18 of the Kyoto Protocol.[121] Article 18 of the Protocol has been introduced by the negotiators because legally binding consequences are assumed to be more effective in ensuring compliance.

While some enforcement measures, such as the suspension of eligibility to participate in the flexible mechanisms, could be considered as part of the *"implied powers"* of an international institution, the substantive deduction of tonnes of a Party's assigned amount in a subsequent commitment period may probably be considered to be of *"a nature as to require an amendment of the protocol"*.[122] And, consequently, ask for an amendment. Such an amendment would not enter into force until three-quarters of the Parties had signed and ratified the amendment, i.e. more than 145 Parties. Experience has demonstrated that this may take a very long time – if at all.

The Kyoto Protocol stipulates legally binding commitments. But TORNEY/FUJIWARA argue appropriately that, in reality, no legally binding conse-

118 Paragraph 5, subparagraph a, section XV, annex to decision 27/CMP.1.

119 Paragraph 5, subparagraph b, section XV, annex to decision 27/CMP.1.

120 Paragraph 5, subparagraph c, section XV, annex to decision 27/CMP.1. Reinstatement is provided for in in accordance with paragraph 3 or paragraph 4, section XX, annex to decision 27/CMP.1 in an expedited procedure.

121 Article 18 of the Kyoto Protocol: *"(...) any procedure and mechanism under this Article entailing binding consequences shall be adopted by means of an amendment of this Protocol."* The extensive powers of the Kyoto Protocol's compliance system necessitated a strong focus on the establishment of a fair and credible institutional regime. SCHRAM STOKKE/HOVI/ULFSTEIN (eds), 3.

122 SCHRAM STOKKE/HOVI/ULFSTEIN (eds), 4, warn that the lack of clarity on these issues may result in an unclear political situation after the first commitment period, for example if certain Annex B-Parties that are found to be in non-compliance have not ratified an amendment that reflects the binding natures of these penalties.

quences for non-compliance exist. There is no credible *"stick"* through which compliance could be enforced by the use of punitive sanctions.[123] This is a serious loophole in the concept of the Kyoto carbon market.

OBERTHÜR/LEFEBER, in contrast, are of the opinion that the strength of the compliance system (unique among Multilateral Environmental Agreements) can be traced to the incentives and disincentives that the overall design of the Protocol and its implementing decisions have generated. Even though Parties have not made the consequences legally binding by adopting an amendment of the Protocol, they can be effectively applied. However, OBERTHÜR/ LEFEBER agree that this is only the case as long as Parties do not withdraw from the Kyoto Protocol and as long as new commitment periods follow.[124]

Either way, it may be concluded that targets are symbolically important. Parties may try harder to meet legally binding targets, not because of the formal legal consequences of non-compliance, but because of the reputational costs associated with failing to comply with legally binding commitments.[125]

2.5 Compliance with International Law

Any linking arrangement created and operating within the realm of international law has to comply with the framework of the international liberalization of the markets and the Kyoto Protocol.[126] Attention must especially be paid to the interface of emission trading and international trade law. International trade is regulated on a multilateral basis by the World Trade Organization (WTO) agreements, including the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS). These agreements prescribe rules to facilitate free and transparent international trade in products and services between Member States.[127]

123 TORNEY/FUJIWARA, 6/7.
124 OBERTHÜR/LEFEBER, 157.
125 TORNEY/FUJIWARA, 7.
126 WEBER, 2008, 482; MEHLING, 126.
127 MACE ET AL., 90.

2.5.1 The Principle of Non-Discrimination

The main relative WTO standards test whether a measure, as applied to goods or services, discriminates between "*like*" goods or services on the basis of their country of origin. The *"most favoured nation"*-principle demands that each WTO Member Party accords to goods, services and service suppliers of any other WTO Member Party treatment no less favourable than the treatment it accords to the goods or services and service suppliers of any other country.[128] Under the "*national treatment*"-principle, each WTO Member Party must accord treatment no less favourable to the products, services and service suppliers of any other Member Party than the treatment it accords to its own domestic products, services and service suppliers.[129]

Several analyses of relevant treaties reveal that the free trade disciplines set out for trade in goods are, for the time being, unlikely to constrain a link between emission trading markets.[130] Emission units would not be impacted by GATT rules that prohibit measures leading to discrimination between products on the basis of country of origin or prohibit quantitative restrictions.[131] However, it is not possible to foresee whether emission units would never be characterized as products for WTO purposes.[132] Most WTO provisions are considered *"continuing"* ones to be interpreted in an evolutionary manner, and the very absence of a fixed definition of *"product"*, it has been said, may allow the notion to evolve over time.[133]

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128 Article I, GATT; Article II GATS.

129 Article III GATT; Article XVIII GATS.

130 WERKSMAN, 255: *"It can be concluded with some confidence that internationally traded emissions allowances are themselves neither goods nor services under the WTO. They are, instead, licences or permits issued by a government authority and entitling (under specified conditions) the holder to carry out a regulated activity within its territory."* See also MACE ET AL., 91, A. PETSONK, *"The Kyoto Protocol and the WTO: Integrating Greenhouse Gas Emissions Allowance Trading Into The Global Marketplace"*, in: Duke Environmental Law & Policy Forum, Volume 10, 1999, 185-220, 200; Z.X. ZHANG, *"Greenhouse Gas Emissions Trading and the World Trading System"*, in: Journal of World Trade, Volume 32, Number 5, 1998, 219-239, 225; G.M. WISER, *"Frontiers in trade: the clean development mechanism"*, in: International Journal of Global Environmental Issues, Volume 2, Numbers 3/4, 2002, 293.

131 MACE ET AL., 92.

132 ZUMBACH, 32.

133 MACE ET AL., 91, referring to MARISA MARTIN, *"Trade Law Implication of Restricting Participation in the European Union Emission Trading Scheme"*, in: Georgetown International Environmental Law Review, Volume 19, Number 3, Spring 2007, 437-474.

Unresolved is also the question whether the trade of emission units may be subject to GATS obligations and, if so, which sectoral classification is applicable: financial, energy or environmental services.[134] Commentators have argued that emission units could be characterized as one or more of the *"derivative products"* recognised for GATS purposes as being traded in the financial services sector.[135]

2.5.2 Emission Units as a Subsidy?

Design choices of regulation and allocation of emission units will most likely affect the competitive relationship between products and services that are governed by WTO disciplines.[136] Therefore, the measures to implement an Emission Trading Scheme must be designed, just as any other domestic measures that have the potential to impact trade, in a manner sensitive to WTO rules against discrimination.[137]

For example, emission units allocated at no cost on the basis of historical emissions (*"grandfathering"*) has been considered as a means to prevent carbon leakage to less regulated markets. The free allocation of emissions units may thus be interpreted as a *"subsidy"* under the *"Subsidies and Countervailing Measures"* (SCM) Agreement.[138] If the allocation methods of emission units undermine the competitive relationship between the subsidized industries and "*like*" products in the international or domestic market, they may be subject to a direct challenge or to countervailing duties.[139] Some authors have also questioned whether a failure to enforce the terms under which emission units are granted constitutes a subsidy.[140] So far, there is no

134 WEBER, 2008, 482.

135 WERKSMAN, 256. See also MACE ET AL., 94, Fn. 425, and MARTIN, (see Fn. above) arguing that emission units could be described as *"futures"*, *"options*", *"transferable securities"*, *"negotiable instruments"* or *"financial assets"* under GATS.

136 WERKSMAN, 252.

137 WERKSMAN, 262.

138 MACE ET AL., 96, referring to PETSONK, 206 (see Fn. above); and S. CHARNOVITZ., *"Trade and climate: potential conflicts and synergies*", Pew Center project *"Beyond Kyoto: Advancing the International Effort against Climate Change"*, Pew Center Washington DC, 2003.

139 WERKSMAN, 259.

140 MACE ET AL., 96, referring to PETSONK, 211 (see Fn. above).

sufficiently relevant guidance from past WTO disputes on either of these issues.[141]

2.5.3 Border Tax Adjustments (BTA) to Compensate for Additional Costs?

As national GHG emission reduction policies differ, national producers of goods who are obliged to comply with high environmental standards may face higher costs than producers in a country with lax environmental standards. Emission Trading Schemes may hence have anti-competitive effects in the same way as taxes do.[142] To counter the consequent risk of carbon leakage, countries may consider introducing carbon-related Border Tax Adjustment (BTA) measures to compensate for the additional costs in connection with the application of the more stringent emissions standard, thus preserving the competitive equality between the compared products.[143] Such BTA measures can either take the form of carbon-taxes on products or the form of an obligation to purchase emission units in the destination country.

The compatibility of such BTA measures under GATT provisions is heavily debated under WTO Law[144] because the discrimination between domestic and foreign producers with regard to internal taxes or other internal charges is prohibited according to the National Treatment Clause of the GATT.[145]

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141 MACE ET AL., 97. See also WERKSMAN, 259, reminding that many WTO Member Parties are heavily subsidizing their fossil fuel industries without having been subject of a GATT or WTO dispute.

142 KAUFMANN/WEBER, 505, referring to KOMMERSKOLLEGIUM, National Board of Trade, *"Climate Measures and Trade, Legal and Economic Aspects of Border Carbon Adjustments"*, 2009, available at <http://www.kommers.se/upload/Analysarkiv/Arbetsomr%C3%A5den/Handel%20och%20h%C3%A5llbar%20utveckling/Handel%20och%20milj%C3%B6%20och%20klimat/Report%202009%202%20Climate%20Measures%20and%20Trade.pdf>, 9-10. However, the equivalence of a carbon tax with the obligation for domestic industry to participate in an Emission Trading Scheme is contested. KAUFMANN/WEBER refer to JAVIER DE CENDRA , "*Can Emissions Trading Schemes be Coupled with Border Tax Adjustmenst? An Analysis vis-à-vis WTO Law"*, in: Review of European Community and International Environmental Law, Volume 15, Number 2, July 2006, 131-145, holding that only Emission Trading Schemes in which emission units are auctioned are comparable to a domestic tax.

143 KAUFMANN/WEBER, 498.

144 See KAUFMANN/WEBER.

145 Article III:2 GATT.

Also, foreign goods are not allowed to be treated less favourably than like domestic goods.[146]

The crucial point thereby is the likeness of products. The test for a "*like product*" in the context of Article III:4 GATT was articulated by a WTO panel in the 1990ies. This panel called for a case-by-case determination in which a panel should assess four criteria: the product's properties, nature and quality; its end-uses in a given market; its tariff classification and consumers preferences.[147] Extending on these criteria, the question obtrudes how production methods influence the "*likeness*" of products and if, hence, the distinction between products produced under the regime of an Emission Trading Scheme and products produced under no or differing environmental standards is also conceivable.

Specific decisions thereon have not yet been taken within the WTO debate and the introduction of BTA measures to compensate for differing carbon prices, be it as a consequence of a participation in an Emission Trading Scheme or be it as a consequence of the submission under other environmental standards, is contested.[148] Firstly, the implementation of BTA is considered to be a violation of both the spirit and the letter of multilateral trade principles requiring equal treatment of like products. Secondly, it is claimed that the application of BTA is a disguised form of protectionism and, thirdly, there are fears that BTA in practice undermines the principle of common but differentiated responsibilities.[149]

2.5.4 Legitimate Non-Trade Policy Goals?

It may be concluded that, by now, the WTO has not finally determined whether the carbon markets fall under its auspices and, if so, whether the trade of emission units concerns goods under the GATT or services under the GATS.[150] However, if a WTO dispute settlement panel has to decide upon the question one day, the trade of emission units is likely to be subject to GATS general obligations and disciplines.[151] Whether such a decision would

146 Article III:4 GATT.

147 WERKSMAN, 259, referring to the WTO-case "*United States – Standards for Reformulated Gasoline*", Report of the Panel, WT/DS2/R, 29 January 1996, paragraph 6.8.

148 KAUFMANN/WEBER, 506-508.

149 KAUFMANN/WEBER, 499.

150 WEBER, 2008, 482.

151 MACE ET AL., 95.

have any practical impact, however, may in any case be challenged by a justification of the measure as being "*necessary*" for the protection of human, animal or plant life or health,[152] or as "*relating to*" the conservation of exhaustible natural resources.[153] A violation of the GATT based on legitimate non-trade policy goals may also be justified by the provision of Article III GATT provided that such interests are adequately balanced against the objective of free trade. As carbon-related BTA measures, for example, are clearly driven by the implementation of environmental goals and mitigating climate change, they are not motivated by avoiding competitive disadvantages for domestic industry.[154] The importance of protecting these public policy interests can be underlined with the jurisprudence of the Appellate Body which increasingly acknowledges human health and environmental interests as justifications, and also with international agreements and resolutions such as the UNFCCC and the subsequent protocols and agreements.[155]

Consequently, the crucial question is whether trade restrictions within an Emission Trading Scheme are either central to the effectiveness of an Emission Trading Scheme, or in contrast, whether trade restrictions are contrary to the Emission Trading Scheme's objectives.[156] WERKSMAN draws the attention to the fact that, at the time of writing his article in 1999, Parties to the Kyoto Protocol disagreed on the question of effectiveness. The author of this thesis perceives that, by today and given the fact that emission trading is reality, the necessity for robust regulation provisions is widely accepted. However, a general consensus on this fundamental question is far from being established as, for example, the ongoing discussion in Switzerland on supplementarity and on the requirements for domestically achieved emission reductions makes evident.

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152 Article XX (b) GATT.

153 Article XX (g) GATT. For a comprehensive discussion see WERKSMAN, 260/261. See also WEBER, 2008, 483; referring also to Article XIV(b) GATS. See also MACE ET AL., 94.

154 KAUFMANN/WEBER, 511.

155 KAUFMANN/WEBER, 522.

156 Ultimately, even the question whether emission trading itself is central to achieve environmental goals will have to be answered.

2.6 Other Major Carbon Markets

There are more countries and regions which are in the process of developing a domestic Emission Trading Scheme. One of the most experienced scheme is the New South Wales Greenhouse Gas Reduction Scheme (NSW GGAS) in Australia.[157] The NSW GGAS commenced on 1 January 2003 and aims at reducing GHG emissions associated with the production and use of electricity. Project-based activities to offset the production of GHG emissions are considered to be the way to achieve this aim.

The Regional Greenhouse Gas Initiative (RGGI) is the first market-based regulatory program in the United States of America to reduce GHG emissions.[158] Ten north-eastern and mid-atlantic states have capped and will reduce CO_2 emissions from the power sector by 10 per cent by 2018.[159] The first compliance period covers the three years from 1 January 2009 to 31 December 2011.[160]

In New Zealand, the Climate Change Response Act of 2002 lays out the legislative framework for the NZ Emissions Trading Scheme (NZ-ETS).[161] A number of amendments passed into law in September 2008. One of the changes is to introduce a transition phase to the scheme between 1 July 2010 and 31 December 2012. During this period, participants will be able to buy emission units from the Government for a fixed price of 25 NZD. In addition, participants in the energy, industrial and liquid fossil fuel sectors will have to surrender only one emission unit for every two tonnes of emissions they produce.

Japan's Voluntary Emission Trading Scheme (JVETS) was launched in 2005 leading to an experimental introduction of an integrated domestic market for

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157 See <http://www.greenhousegas.nsw.gov.au/>, accessed on 14 November 2011.

158 The Memorandum of Understanding of 20 December 2005 outlines the framework, available at <http://www.rggi.org/docs/mou_final_12_20_05.pdf>, accessed on 14 November 2011.

159 Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

160 For general information see Fact Sheet available at <http://www.rggi.org/docs/RGGI_Fact_Sheet.pdf >, accessed on 14 November 2011.

161 See <http://www.climatechange.govt.nz/emissions-trading-scheme/about/basics.html>, accessed on 14 November 2011.

emission trading in 2008.[162] The results lead to the *"Basic Act on Global Warming Countermeasures",* approved by the cabinet on 12 March 2010, which foresees to elaborate legislative measures for establishing a domestic Emission Trading Scheme within around one year after coming in to force of the Basic Act.[163]

There is an additional category of emission units available. When private and corporate consumers intend to offset their emissions, they usually acquire and transfer *"Voluntary Emission Reductions"* (VERs). VERs are emission units sold on the so-called *"Voluntary Carbon Markets*" which are (in contrast to the regulated Kyoto carbon market and the regional or national Emission Trading Schemes) hardly regulated neither by international nor by national legislation.[164] VERs can not be traded in regulated carbon markets such as the Kyoto carbon market or the EU-ETS and the CH-ETS. But the voluntary markets have provided a significant benefit by building public awareness and infrastructure for transactions also in the regulated cap-and-trade markets and by informing about government climate policies.[165]

2.7 Outlook on the Future of the International Climate Framework

The text of the Kyoto Protocol stipulates that negotiations towards a second commitment period should commence *"at least seven years before the end of the first commitment period*".[166] CMP.1 took the decision to initiate considerations on further commitments for Annex I-Parties in December 2005.[167] Near the end of 2007, a two-year framework for negotiations (the

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162 See EISAKU TODA, *"The current status of the Emission Trading Scheme in Japan"*, presentation of 16 March 2010, available at <http://www.env.go.jp/en/earth/ets/mkt_mech/current-ets100316.pdf>, accessed on 14 November 2011.

163 For a provisional translation of the bill of the Basic Act see <http://www.env.go.jp/en/earth/cc/bagwc/overview_bill.pdf>, accessed on 14 November 2011.

164 For a general overview see KATE HAMILTON/MOLLY PETERS-STANLEY/THOMAS MARCELLO, "*Building Bridges: State of the Voluntary Carbon Markets 2010*", available at <http://www.ecosystemmarketplace.com/pages/dynamic/resources.library.page.php?page_id=7585&section=our_publications&eod=1>, accessed on 14 November 2011.

165 PASSERO, 518.

166 Article 3, paragraph 9 of the Kyoto Protocol.

167 Decision 1/CMP.1.

so-called *"Bali Action Plan"*) was launched with a view to reaching an agreed outcome at the Climate Change Summit in Copenhagen in 2009.

The Bali Action Plan did not conclude in Copenhagen. The Copenhagen Accord has not yielded a legally binding power over formal commitments by Parties. But it provides political guidance for continuation of negotiations for a future agreement without specifying an end date.[168] The legal status of the Accord is uncertain, as it was only taken note of by the COP rather than being adopted as a formal COP decision.[169]

The failure to agree at Copenhagen on further commitments for developed countries within the framework of the Kyoto Protocol has led to serious concerns that there may be a gap between the first and subsequent commitment periods under the Protocol.[170] The Ad Hoc Working Group on Further Commitments for Annex I-Parties under the Kyoto Protocol (AWG-KP) has published, in July 2010, a document with the title *"Legal considerations relating to a possible gap between the first and subsequent commitment periods"*.[171]

Meanwhile, the Conference on Climate Change in Cancun in 2010 has restored trust in the international negotiations.[172] With numerous references to the Framework Convention, the decisions of Cancun fuel the hope that potential new instruments will be rooted in the prolongation of the UNFCCC.[173] Although some political principles have been captured in a series of decisions and significant advances made on finance, technology, action to address deforestation and intensified reporting obligations, important questions for the long-term response to climate change remain unre-

168 Decision 2/CP.15.

169 TORNEY/FUJIWARA, 2.

170 TORNEY/FUJIWARA, 3; HEUBERGER, 839; BOISSON DE CHAZOURNES, 808; See also GERD KOLBE, *"Die Klimapolitik dreht sich im Kreise"*, in: Neue Zürcher Zeitung (NZZ), 17 June 2011, available at <http://www.nzz.ch/nachrichten/politik/international/die_klimapolitik_dreht_sich_im_kreis_1.10958936.html>.

171 FCCC/KP/AWG/2010/10 of 20 July 2010, available at <http://unfccc.int/resource/docs/2010/awg13/eng/10.pdf>.

172 BOISSON DE CHAZOURNES, 808: *„Après la grand déception de Copenhague, la récente Conférence des Parties à Cancun a remis le processus multilatéral sur les rails."* The 16th United Nations Conference on Climate Change in Cancun/Mexico was held from 29 November to 10 December 2010.

173 BOISSON DE CHAZOURNES, 809.

solved.[174] If trust could be restored, clarity on the future of carbon markets could not be established in Cancun, leaving a significant challenge for the Conference on Climate Change in Durban towards the end of 2011.[175]

174 HEUBERGER, 842-845. See also KPMG, Business and industry issue of 13 January 2011, available at <www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/kpmg-cop16-cancun/pages/post-cancun-what-it-means.aspx>.

175 The 17th United Nations Conference on Climate Change will be held from 28 November to 9 December 2011 in Durban, South Africa.

3 The Emission Trading Scheme of the European Union

3.1 Introduction

The EU-ETS was originally established as a domestic policy tool to achieve the Article 3.1-commitment of the EU and its Member States.[176] In order to increase the cost-effectiveness of achieving the Community emission reductions target, however, linking the Community scheme to GHG Emission Trading Schemes in third countries was foreseen since its inception.[177]

Whereas the post-Kyoto regulatory regime on international level is yet undecided, phase III of the EU-ETS from 2013 to 2020 is well defined by the revised ETS-Directive of 2009 and its subsequent regulations.

The following sections concentrate on the regulations on Community level by the ETS-Directive and its subsequent regulations. The implementation by Member States is not subject of this thesis.

3.2 Current EU-Legislation

The European Union is a Party to the United Nations Framework Convention on Climate Change. Under the Kyoto Protocol, the EU-15 took on a common commitment to reduce emissions by 8 per cent between 2008 and 2012 compared to emissions in the *"base-year"*.[178] The EU-27 does not have a common target under the Kyoto Protocol in the same way as the EU-15 does.

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176 With Article 3, paragraph 1 of the Kyoto Protocol *("the Article 3.1-commitment"*), binding commitments have been agreed for those Parties which are listed in Annex B of the Kyoto Protocol.

177 Preamble, recital 18 of the Original ETS-Directive.

178 For the EU-15, the base-year for CO_2, CH_4 and N_2O is 1990; for fluorinated gases 12 Member States have selected 1995 as the base-year, whereas Austria, France and Italy have chosen 1990 as the base-year. See EUROPEAN ENERGY AGENCY, *"Annual GHG Inventory 1990-2008 and Inventory Report"*, 2010, 5, Fn. 1.

During the negotiations of the Kyoto Protocol, the EU and its Member States opposed the introduction of any market-based flexible instruments into the international climate regime.

Nevertheless, in order to ensure that the Kyoto Protocol would enter into force, the EU conceded and agreed to the market-based mechanisms of the Kyoto Protocol.[179] Following US rejection of the Kyoto Protocol in March 2001, the EU faced increased pressure not only to demonstrate international climate policy leadership by saving the Kyoto Protocol, but also to set up a legal framework that would allow the Emission Trading Scheme of the EU to take up operations as early as possible.[180]

Most EU Member States were used to domestic command-and-control measures, such as energy taxes or voluntary agreements and the idea of having a free market regulating the access to a global public good appeared suspicious. An EU-wide CO_2 emissions tax seemed not to be possible at the time since one had been proposed and rejected in the 1990s.

A cap-and-trade approach, on the contrary, guaranteed a limit on a significant part of the EU's emissions, it was compatible with the emission trading provision of the Kyoto Protocol, and it seemed to be the only other instrument available.[181]

As any linking arrangement operating within the realm of international law, the Emission Trading Scheme of the European Union hast to be designed such as to comply with the framework of the international liberalization of the markets and the Kyoto Protocol.[182] Attention must also be paid to the interface of emission trading and international trade law. International trade is regulated on a multilateral basis by the World Trade Organization (WTO)

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179 POHLMANN, 340. There are four reasons why the EU's attitude has changed: 1) The EU wanted to prepare itself for a potential IET that was expected to become operational by 2008; 2) Key personnel in the Environment Directorate-General of the European Commission were replaced by economists who favoured economic policy instruments; 3) The EU became increasingly aware of the need of market-based mechanisms to achieve its Kyoto target without compromising the EU industry's competitiveness; 4) The earlier proposal of a Directive on an EU-wide carbon/energy tax became more and more likely to fail. POHLMANN, 340, referring to J. BIRGER SKJÆRSETH/J. WETTESTAD, *"EU Emissions Trading: Initiation, Decision-making and Implementation"*, Ashgate Publishing. Aldershot, 2008, 74-99.

180 See POHLMANN, 340/341.

181 ELLERMAN/JOSKOW, 7/8.

182 WEBER, 2008, 482; MEHLING, 126.

agreements, including the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS) prescribing rules to facilitate free and transparent international trade in products and services between Member States.[183]

3.2.1 Approval of Kyoto Protocol

The European Community and the initial 15 EU Member States signed the Kyoto Protocol on 29 April 1998.[184] With Council Decision 2002/358/EC of 25 April 2002, the Kyoto Protocol was approved on behalf of the European Community.[185] The ratification of the Kyoto Protocol by the European Community and by each of the 15 initial Member States took place on 31 May 2002.[186]

With the same Decision, a burden sharing commitment regarding the contributions of each Member State to the overall Community reduction became legally binding among EU Member States.[187] Article 2 of Decision 2002/358/EC ascertains that, in accordance with the provisions of Article 4 of the Kyoto Protocol, the European Community and its Member States have decided to fulfil their Article 3.1-commitments of the Kyoto Protocol *"jointly*".[188] (Figure 3)

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183 MACE ET AL., 90.

184 Since the EC is not endowed with exclusive treaty-making competence in the area of environmental policy, the EU Member States themselves were also able to negotiate, sign, and ratify the UNFCCC and the Kyoto Protocol under the so-called *"mixed"* competence.

185 Article 1 of Decision 2002/358/EC.

186 See Press Release "*European Union ratifies the Kyoto Protocol*" of 31 May 2002, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/02/794&format=HTML&aged=1&language=EN&guiLanguage=en>.

187 The so-called "*Burden Sharing Agreement*" was decided by the Environment Council of 16 to 17 June 1998, Doc. 9702/98 of 19 June 1998 of the Council of the European Union, Annex I. See also POHLMANN, 338, Fn. 5.

188 Article 4, paragraph 2, subparagraph b UNFCCC provides that some Parties commit themselves to reduce emissions *"with the aim of returning individually or jointly to their 1990 levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol"*. - "*Individually or jointly*" - the lack of concretion left room for interpretation. The Member States of the EU maintained that, under this provision, they would be allowed to agree on an internal "*burden-sharing arrangement"*. See OBERTHÜR/OTT, 141.

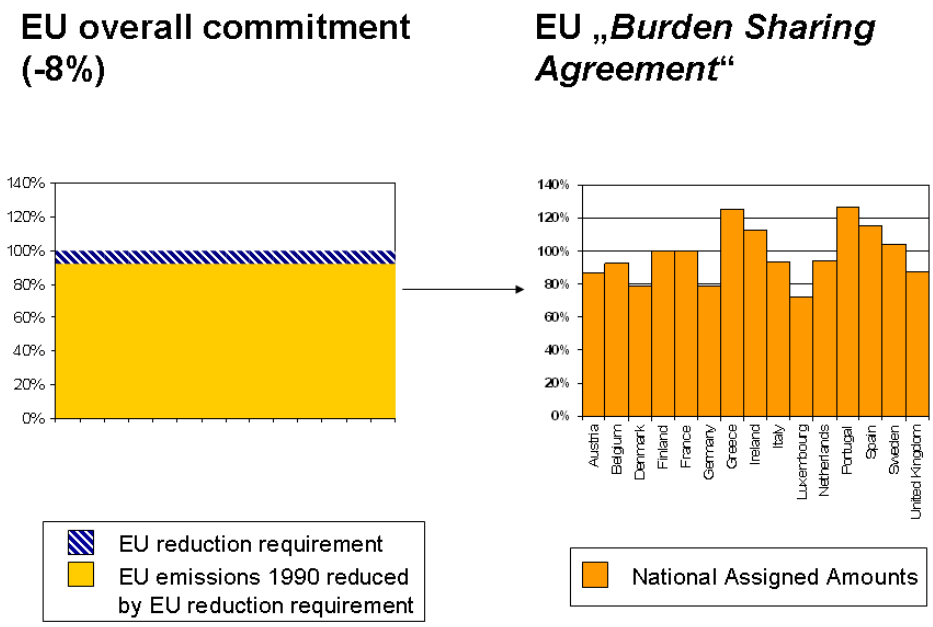

Figure 3: "Burden Sharing Agreement" (BSA)
The European Community and its Member States have decided to fulfil their Article 3.1-commitments of the Kyoto Protocol *"jointly"* by translating the 8 per cent emission reduction target of the EC under the Kyoto Protocol into differentiated emission reduction or limitation targets for each of the initial 15 EU Member States.

Annex II to Decision 2002/358/EC translates the 8 per cent emission reduction target of the EC under the Kyoto Protocol into differentiated emission reduction or limitation targets for each of the initial 15 EU Member States for the initial commitment period from 2008 to 2012. The 8 per cent reduction target was redistributed by giving the United Kingdom, for example, a target of 12.5 per cent reduction but allowing Portugal an increase of 27 per cent. The 12 new EU Member States are not covered by this Decision and have, except for Malta and Cyprus, individual emission reduction targets under the Kyoto Protocol. (Table)

Table: 27 EU Member States and their targets under Annex II of Decision 2002/358/EC[189]

EU-15 markets	BSA target (%)	Further EU-27 markets	Kyoto Protocol target (%)
Austria	-13	Bulgaria	-8
Belgium	-7.5	Cyprus	No target
Denmark	-21	Czech Republic	-8
Finland	0	Estonia	-8
France	0	Hungary	-6
Germany	-21	Latvia	-8
Greece	+25	Lithuania	-8
Ireland	+13	Malta	No target
Italy	-6.5	Poland	-6
Luxembourg	-28	Romania	-8
Netherlands	-6	Slovakia	-8
Portugal	+27	Slovenia	-8
Spain	+15		
Sweden	+4		
United Kingdom	-12.5		

3.2.2 Original ETS-Directive

In a Green Paper issued in March 2000, a cap-and-trade program was suggested as an important component of the European Climate Change Program.[190] A concrete and specific implementing Directive was not proposed

189 Table after POHLMANN, 338.

190 EUROPEAN COMMISSION, *"Green Paper on greenhouse gas emissions trading within the European Union"*, Brussels, 8.3.2000, COM(2000) 87 final, available at <http://eur-lex.europa.eu/LexUriServ/site/en/com/2000/com2000_0087en01.pdf>. The European Community's activities with regard to climate change is based on the requirements of

until October 2001, barely three years before the program was to start. The release of the proposed EU Directive on GHG emission trading in October 2001 initiated the so-called *"co-decision process"*, whereby the European Parliament and the European Council would review, amend, and approve or reject the Directive.[191] The final approval by the Council of Ministers occurred in July 2003, and the Directive was formally issued in October 2003, a little more than a year before the program was to begin.[192]

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 formally establishes a scheme for GHG emission allowance[193] trading within the Community.[194] The aim of the ETS-Directive is to *"contribute to fulfiling the commitments of the European Community and its Member States more effectively, through an efficient European market in greenhouse gas emissions allowances, with the least possible diminution of economic development and employment."*[195]

Since the EU-ETS was adopted by way of a Directive, each EU Member State had to transpose the Directive into national law. Member State governments were required to issue legislative and regulatory measures to implement the Directive within each national jurisdiction by 31 December 2003.[196]

Article 174, paragraph 1 and 2 of the EC-Treaty, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12002E174:EN:HTML>.

191 CONVERY/REDMOND, 90/91. The co-decision process was introduced by the Treaty of Maastricht to enhance the democratic functioning of the European institutions. A legislative proposal can become EU policy only with the approval of both, the Parliament and the Council.

192 ELLERMAN/JOSKOW, 8.

193 The official title of Directive 2003/87/EC uses the term *"emission allowance trading"* instead of the often used yet imprecise *"emission trading"*.

194 Thereafter cited as *"Original ETS-Directive"*, as opposed to the *"Consolidated ETS-Directive"* established by Directive 2009/29/EC.

195 Preamble, recital 5 of the Original and Consolidated ETS-Directive.

196 Article 31, paragraph 1 of the Original ETS-Directive. A directive under EU law is a legislative act, which is not self-executing but instead identifies a certain legally binding set of objectives while giving Member States some margins on how to transpose those objectives into national law. POHLMANN, 341, Fn. 19. See also ELLERMAN/JOSKOW, 8.

3.2.3 Linking-Directive

As soon as a substantive agreement had been reached on the ETS-Directive, the Commission issued the proposal for the so-called *"Linking-Directive"* on 23 July 2003. Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 was adopted after intensive debates and differed significantly from the Commissions' proposal.[197] One of the most important changes was to allow ETS-participants to use CDM credits for compliance in phase I from 2005 to 2007 instead of beginning in 2008 as was initially proposed and as it is the case for JI credits.[198]

Another important change was that, contrary to the proposal, operators are allowed to use CERs and ERUs directly and without conversion to offset their reduction obligations under the ETS-Directive.[199]

3.2.4 Aviation-Directive

Emissions from aviation are growing faster than from any other sector. All forecasts indicate that they will continue to do so under business-as-usual conditions.[200] Increasingly concerned that the emission trends in the aviation sector could undermine the effectiveness of EU climate policy, the European Commission issued Directive 2008/101/EC of 19 November 2008 amending Directive 2003/87/EC, addressing all the airlines landing and starting on EU airports, including non-EU airlines as of 1 January 2012.[201]

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197 DE SÉPIBUS, Linking, 2008, 5, Fn. 22, referring for more details on the linking debate preceding the adoption of the Directive to JÜRGEN LEFEVERE, "*Linking Emissions Trading Schemes: The EU ETS and the Linking Directive*", in: DAVID FREESTONE /CHARLOTTE STRECK (eds), *"Legal aspects of implementing the Kyoto Protocol mechanisms: making Kyoto work"*, Oxford 2005, 511-533, 516; KAROLINE HÆGSTAD FLÅM, *"A Multi-level Analysis of the EU Linking Directive Process – The Controversial Connection between EU and Global Climate Policy"*, Fridtjof Nansen Institute, 2007, 25ff; GERNOT KLEPPER/SONJA PETERSON, *"Emission Trading, CDM, JI, and More – The Climate Strategy of the EU"*, Kiel Institute for World Economics, April 2005.

198 CONVERY/REDMOND, 91.

199 DE SÉPIBUS, Linking, 2008, 6.

200 EUROPEAN COMMISSION, Press Release of 7 March 2011, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/259>.

201 Whether the inclusion of third-country airlines into the EU-ETS is compatible with international law is subject of an judicial dispute. See below.

3.2.5 Revised ETS-Directive

Article 30 of the Original ETS-Directive asked the Commission to submit a report to the European Parliament and the Council by 30 June 2006 on the application of the Original ETS-Directive.

On 13 November 2006, responding to Article 30, the Commission adopted a *"Review Communication*" where it identified growing consensus on the key strategic issues for review.[202] Four main topics were identified in the Review Communication: (1) scope, (2) robust compliance and enforcement, (3) further harmonization and increased predictability and (4) linking with Emission Trading Schemes in third countries. Each of these topics has been dealt with extensively within a subsequently established Working Group.[203] Their reports represent a major input to the *"Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system"* which was put forward, together with an extensive accompanying document, the so-called *"Impact Assessment",* on 23 January 2008.[204]

The amending ETS-Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009[205] was adopted as part of a climate-energy package containing measures to fight climate change and promote renewable energy. The package underlines the objective of limiting the rise in global average temperature to no more than two degrees Celsius above pre-

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202 EUROPEAN COMMISSION, "*Building a Global Carbon Market*", 2006. See Press Release "*Climate change: Commission sets out agenda for revising the EU emission trading scheme from 2013*" of 13 November 2006, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/1548&format=HTML&aged=1&language=EN&guiLanguage=en >.

203 The Working Groups consisted of representatives of all interested Member States, the power sector (conventional and renewable), the energy-intensive industry and non-energy ETS sectors, the carbon trading sector, the oil and gas sector as well as cross sector business associations. Non-governmental organizations, representatives of the research community and other relevant institutions/organizations were also invited and participated actively.

204 EUROPEAN COMMISSION, *"Impact Assessment", 2008*. Annexed to the Impact Assessment are the final reports of the meetings of the Working Group preparing for the Proposal of the Amending ETS-Directive.

205 Thereafter referred to as *"Consolidated ETS-Directive"* as opposed to the Original ETS-Directive. Where the provisions have remained unchanged, reference is made to the *"Original and Consolidated ETS-Directive"*.

industrial levels.[206] To achieve this goal, the EU committed to an unilateral emission reduction target of 20 per cent by 2020, compared with 1990 levels, and agreed to a reduction of 30 per cent provided that other major emitters agree to take on their fair share of a global reduction effort.[207] Hence, if there is a new international climate agreement which commits the EU to a stronger target, the European Commission is mandated to submit a legislative proposal to further revise the EU-ETS in order to enable the EU to meet this target.[208]

Both, trading within sectors covered by the EU-ETS and within sectors not covered *("Non EU-ETS"*), will contribute to the 20 per cent objective. The Non EU-ETS sector broadly includes direct emissions from households and services, as well as emissions from transport, waste and agriculture. The volume of the non-trading sectors currently represents about 60 per cent of total GHG emissions.[209]

3.2.6 Incorporation of ETS-Directive into the EEA Agreement

On 26 October 2007, the EU announced that Iceland, Liechtenstein and Norway, three countries of the European Free Trade Area (EFTA) will link to the EU-ETS *"through the incorporation of the EU-ETS Directive into the European Economic Area Agreement"* (EEA Agreement), to be followed by national approval procedures.[210] Whereas the European Commission in its press release uses the term *"link"*, other observers stress that, formally

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206 Preamble, recital 2 of Directive 2009/29/EC.

207 Preamble, recital 3 of Directive 2009/29/EC: *"The European Council of March 2007 made a firm commitment to reduce the overall greenhouse gas emissions of the Community by at least 20% below 1990 levels by 2020, and by 30% provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries contribute adequately according to their responsibilities and respective capabilities."*; See also Article 28, paragraph 1 of the Consolidated ETS-Directive, comprising provisions for adjustments applicable upon the approval of an international agreement on climate change by the Community.

208 See also STERK/MEHLING/TUERK, 5.

209 EEA 2010, Executive Summary, 6.

210 EU COMMISSION, *"Emissions trading: Commission announces linkage EU ETS with Norway, Iceland and Liechtenstein"*, Press Release of 26 October 2007, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1617>.

speaking, it is not a *"link"* but rather an *"adoption of the ETS-Directive in the framework of the EFTA"*.[211]

Whereas Liechtenstein and Iceland did not have an Emission Trading Scheme in place, Norway had established a cap-and-trade system very similar to the EU-ETS. Like the EU-ETS, Norway's Greenhouse Gas Emission Trading Act (GGET act) entered into force on 1 January 2005.[212] It creates a duty for covered entities to surrender CO_2 emissions units that are freely transferable. For the period from 2005 to 2007, the Act covered about 10-15 per cent of Norway's GHG emissions.[213]

3.3 Coverage of the Scheme

3.3.1 The Cap

The *"cap"* determines the maximum amount of emissions possible under a given Emission Trading Scheme. Setting the cap (the number of emission units allocated) is one of the most important decisions in the design of any cap-and-trade program.[214]

Under the EU-ETS, Member States face two limits (*"caps"*) on their CO_2 emissions during the Kyoto period.[215] The first is the *"Kyoto cap"* which results from the provisions of the Kyoto Protocol. The second cap is the *"EU-ETS cap"* constituting a sort of a "*cap within a cap*".[216]

3.3.1.1 EU-Commitment under Kyoto

The EU commitment under Article 3, paragraph 1 of the Kyoto Protocol is to reduce the base-year emission of the EU-15 by 8 per cent in the period from 2008 to 2012. Following the UNFCCC reviews of Member States' *"initial*

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211 FIRST CLIMATE/ ECONABILITY, 72.

212 Available at <http://www.lovdata.no/all/hl-20041217-099.html>. For English version, see <http://www.regjeringen.no/en/doc/Laws/Acts/greenhouse-gas-emission-tradingact.html?id=172242>.

213 For more details on the Norwegian ETS, see MACE ET AL, 5-7.

214 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 8.

215 Since the first Kyoto period only started in 2008, this did not apply during the pilot phase of the EU-ETS.

216 CONVERY/REDMOND, 90/91; ELLERMAN/JOSKOW, 3.

reports" during 2007 and 2008, the base-year emissions for the EU-15 have been fixed to 4'265.5 million tCO_2e.[217] The yearly reduction commitment of the EU-15 is, hence, 341.24 million tCO_2e.

The EU-27 does not have a common target under the Kyoto Protocol in the same way as the EU-15 because not all the Member States of the EU-27 are Annex-B Parties. As Cyprus, Malta and the EU-27 do not have targets under the Kyoto Protocol, they do not have applicable Kyoto Protocol base-years. The European Energy Agency calculated for the EU-27 total GHG emission of 5'567.0 million tCO_2e in the base-year 1990.[218]

3.3.1.2 EU-ETS Coverage

In phase I of the EU-ETS, the volume of the EU-ETS sectors represented about 41 per cent of Community-wide GHG emissions.[219]

As of 2008, there were about 10'800 installations included in the EU-ETS representing a large range of emitters with annual emissions varying from less than 5'000 tCO_2e (ca. 3'000 installations) to more than 5 million tCO_2e (ca. 70 installations).[220] The final allocations of emissions units in phase II amounted to almost 2'000 million tCO_2 per year.[221]

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217 EUROPEAN ENERGY AGENCY, *"Annual GHG Inventory 1990-2008 and Inventory Report"*, 2010, Executive Summary, 7. Calculation method pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol and, hence, including LULUCF. Base-year emissions for EU-15 excluding LULUCF amount to 4'244.7 million tCO_2e.

218 EUROPEAN ENERGY AGENCY, *"Annual GHG Inventory 1990-2008 and Inventory Report"*, 2010, Executive Summary, 10. GHG emission data for the EU-27 as a whole according to the EEA refer to domestic emissions within the EU-27's territory and do not include emissions and removals from Land Use and Land Use Change (LULUCF) nor do they include emissions from international aviation and international maritime transport.

219 EUROPEAN COMMISSION, "*Impact Assessment*", 13. Calculated on the basis of 2005 data, about 10'500 installations across the 27 Member States accounting for about 41 per cent of Community-wide GHG emissions were covered in the phase I of the EU-ETS. Note that these figures are estimations. MCALLISTER, 408, mentions 11'500 installations. POHLMANN, 345, mentions around 11'000 installation, accounting for about 45 per cent of EU-wide total CO_2 emissions or about 30 per cent of its total Kyoto GHG emissions.

220 EUROPEAN COMMISSION, "*Impact Assessment"*, 23.

221 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12.

On 9 July 2010, the Commission has communicated the cap for 2013 being just under 1.927 billion emission units.[222] This Community-wide quantity of emission units shall decrease in a linear factor of 1.74 per cent compared to the average annual total quantity of emission units.[223] The linear factor shall be reviewed as from 2020, with a view to the adoption of a decision by 2025.[224]

3.3.1.3 "*Cap within a cap*"

The EU-ETS, hence, covers far less than half of all the CO_2 emissions contained in the Kyoto cap of the EU. Consequently, more than half of the CO_2 and GHG emissions in the EU are not covered by the EU-ETS and must be reduced in Non EU-ETS sectors.[225] The size of the Non EU-ETS allows a considerable flexibility in setting the cap for EU-ETS covered sectors without running the risk to miss the Kyoto cap. If the EU-ETS cap is set on a non-ambitious level, it is up to the Non EU-ETS sectors to make up the difference to reach the Kyoto reduction target.[226] (Figure 4)

The EU-Commission has realized the importance of the Non EU-ETS sectors with regard to reaching compliance with the Article 3.1-commitment. Decision 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions addresses further climate-energy measures in the Non EU-ETS sectors. Doubts whether the Decision together with further climate-energy measures of the European Union are sufficient to effectively combat climate change have been voiced.[227]

The differing reduction requirements in the EU-ETS compared to the Non EU-ETS leads to considerable competitive distortion. A study conducted by

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222 The average annual total amount of EUAs for the period from 2008 to 2012 being calculated at 2,032,998,912 EUAs and subtracting 1.74 per cent thereof (35,374,181 EUAs) equals the cap for 2013 at 1,926,876,368 EUAs.

223 Article 9, paragraph 1 of the Consolidated ETS-Directive.

224 Article 9, paragraph 3 of the Consolidated ETS-Directive.

225 Decision 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020, OJ L 140/136, 5.6.2009, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0136:0148:EN:PDF>.

226 EPINEY, 239.

227 EPINEY, 239.

ECOPLAN in 2010 concluded that marginal abatement costs in the EU-ETS currently amount to 16 CHF/tCO_2e, in the Non EU-ETS to 82 CHF/tCO_2e.[228]

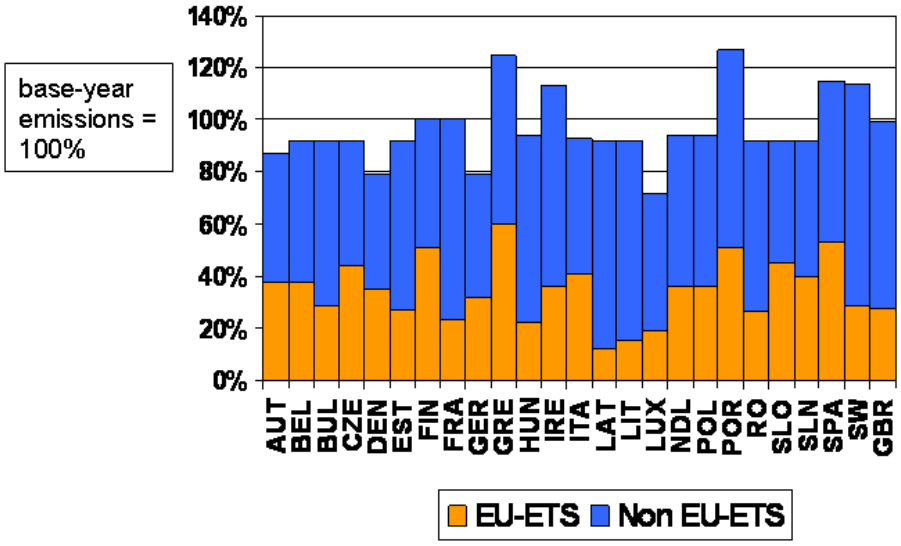

Figure 4: A "Cap within a Cap"
The weaker the EU-ETS cap is (in concrete terms: the higher the amount of EUAs), the stronger is the necessity to reduce emissions in the Non EU-ETS sector in order to comply with the Kyoto commitment. The national assigned amount remains the same.

3.3.2 Periods

The EU-ETS is designed to operate in phases. Article 11 of the Original ETS-Directive mentions the "*three-year period beginning 1 January 2005"*[229] and the *"five-year period beginning 1 January 2008".*[230] Hence, phase II is isochronic with the commitments under the Kyoto Protocol. Phase III has been defined to operate in the period from 2013 to 2020.[231]

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228 ECOPLAN, 20/21.
229 Article 11, paragraph 1 of the Original ETS-Directive.
230 Article 11, paragraph 2 of the Original ETS-Directive.
231 Article 13, paragraph 1 of the Consolidated ETS-Directive: *"Emission units issued from 1 January 2013 onwards shall be valid for emissions during periods of eight years beginning on 1 January 2013."*

Phase I, from 2005 to 2007, was meant to be a learning period. It was insulated from subsequent phases so that any major problems would not carry over into subsequent periods.[232] This warm-up phase was expected to provide the experience and establish the infrastructure to ensure success in the *"real"* mitigation period corresponding to the first commitment period under the Kyoto Protocol.[233]

3.3.3 Sectors and Gases covered

The gases covered by the ETS-Directive are listed in its Annex II.[234] The list corresponds to the six gases included in the Kyoto Protocol. Corresponding to the activities listed in Annex I of the Original ETS-Directive, however, the EU-ETS has only been applied to CO_2 emissions in phase I and phase II.[235]

In the Original ETS-Directive of 2003, the list was limited to ten activities in the area of energy, production and processing of ferrous metals, mineral industry and the production of pulp, paper and board with a specific production capacity, mostly subject to a minimum threshold for output.[236] Transport was completely excluded.[237] However, the role of transport in climate change was indirectly acknowledged in the ETS-Directive. In order to generate substantial emission reduction, the Commission is asked to consider policies and measures for the transport sector at Community level.[238]

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232 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 9.

233 ELLERMAN/JOSKOW, 7.

234 Article 2, paragraph 1 of the Original and Consolidated ETS-Directive.

235 Annex I of the Original ETS-Directive.

236 The review process made clear that, in phase I of the EU-ETS, different interpretations of combustion installations were used by Member States leading to differences in the coverage of similar installations under the EU-ETS. As a result, competitive distortions on the internal market of the EU occurred. EUROPEAN COMMISSION, "*Impact Assessment*", 17.

237 Road transport accounts for about 19 per cent of the Community-wide CO_2-emissions. Road transport represents one of the fastest growing GHG emission sources. CO_2 originating from the fuel consumed by passenger cars and heavy vehicles has increased over the period from 1990 to 2004 by 26 per cent. EUROPEAN COMMISSION, "*Impact Assessment*", 53.

238 Preamble, recital 25 of the Original and Consolidated ETS-Directive.

From the outset, it was foreseen to enlarge the scope of the EU-ETS after the learning period.[239] With regard to phase III of the EU-ETS, the list of activities in Annex I of the Consolidated ETS-Directive has been expanded to twenty-nine activities, including aviation as of 1 January 2012.

With the modifications brought about with the amendments of Directive 2009/29/EC, the list of activities covered becomes larger and the EU-ETS is, theoretically, going to be expanded to new gases such as N_2O and PFCs from the chemical and aluminium sectors.[240] Following the activities listed in Annex I of the Consolidated ETS-Directive, however, the EU-ETS will, in practice, still cover CO_2 almost exclusively.[241]

3.4 Stationary Installations

3.4.1 Permits, Opting-in and Opting-out

According to Article 4 of the Original ETS-Directive, the Member States have to ensure that companies carrying out one of the listed activities in Annex I hold a *"permit"* issued by a competent national authority.

With the amendment of Directive 2009/20/EC, Article 4 is extended to unilaterally included gases and activities according to Article 24 of the Consolidated ETS-Directive (*"opting-in"*). According to Article 24 of the ETS-Directive, Member States were allowed to unilaterally include additional activities, installations, and GHGs not listed in Annex I to the EU-ETS Directive covered by the EU-ETS as of 2008, subject to prior approval by the European Commission.[242] For example France and the Netherlands applied to the European Commission for an opt-in of N_2O emissions from the production of fertilizers, and the United Kingdom and Norway, the latter being linked to the EU-ETS as a non-EU Member State as of 2008, have applied

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239 Article 30, paragraph 2(a) of the Original ETS-Directive asked for a Review considering "*how and whether Annex I should be amended to include other relevant sectors (...) with a view to further improving the economic efficiency of the scheme."*

240 Perfluorocarbons emitted by the production of primary aluminium, nitrous oxide by the production of nitric acid, adipic acid and glyoxal and glyoxylic acid.

241 EPINEY, 238.

242 Article 24, paragraph 1 of the Original ETS-Directive, slightly adapted in the Consolidated ETS-Directive.

for the inclusion of Carbon Dioxide Capture and Storage (CCS) activities as of 2008.[243]

The application for a permit has to include a description of the installation and its activities including the technology used, the raw and auxiliary materials used, the sources of emissions of gases and the measures planned to monitor and report emissions.[244] The competent authority shall issue a GHG permit only *"if it is satisfied that the operator is capable of monitoring and reporting emissions"* and has to review the permit at least every five years.[245]

A permit, hence, can be considered as a public authorization or license that is issued by way of an administrative act, and is linked to one or more specific installations. Consequently, the GHG permit cannot be traded.[246]

A study in 2007 made apparent that the contribution of small and large emitters to the overall emissions covered by the EU-ETS is very uneven: The largest 7 per cent of installations in the EU-ETS represent 60 per cent of total emissions, while the smaller 14 per cent of installations only account for 0.14 per cent.[247] Since the cost-benefit ratio for including small emitters appears unbalanced, Article 27 introduced into the ETS-Directive with the amendments of Directive 2009/29/EC provides that Member States may exclude from the Community scheme installations which have reported emissions of less than 25'000 tCO_2e and, where they carry out combustion activities which have a related thermal input below 35 megawatt *("opting-out")*.[248]

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243 POHLMANN, 344, Fn. 34.

244 Article 5, paragraph a)-d) of the Consolidated ETS-Directive.

245 Article 6, paragraph 1 of the Consolidated ETS-Directive.

246 POHLMANN, 348.

247 EUROPEAN COMMISSION, "*Impact Assessment*", 2008, 23, referring to ECOFYS, "*Small Installations within the EU Emissions Trading Scheme"*, Brussels 2007. See also JARAITE/CONVERY/DI MARIA, 10.

248 Article 27, paragraph 1 of the Consolidated ETS-Directive. However, the Commission made clear that an exclusion of small emitters from the EU-ETS on the grounds of cost-effectiveness cannot mean that these installations do not need to contribute to the overall emission reduction targets of the EU. The Commission highlights the need to find other more cost-effective measures to ensure the same objective and proposes: *"With respect to alternative instruments, a CO_2 tax might be preferable to the EU-ETS in the case of small emitters excluded from the EU-ETS."* EUROPEAN COMMISSION, "*Impact Assessment*", 2008, 31.

In addition, Member States may allow simplified monitoring, reporting and verification measures for installations with average annual verified emissions which are below 5'000 tonnes a year.[249]

3.4.2 Cap-Setting

In phase I and II, the EU-ETS itself did not set a cap to the number of emission units, but left the decision to fix the maximal amount of emission units allocated to their industry in the National Allocation Plans (NAPs) to the Member States.[250] The Commission's guidance for submission of NAPs for the first period was modest. It had stipulated that the Member State's cap must be either the expected emissions from 2005 to 2007 or the emissions according to the Member State's *"path to Kyoto*", whichever is the lower amount.[251] The NAPs were then submitted to the European Commission, which had to assess them and decide whether to grant approval.[252] The Commission could reject a plan, or any aspect thereof, if it found it to be incompatible with the criteria set out in Annex III of the Original ETS-Directive.[253]

Initially, the Commission envisaged that, by the end of June 2004, it would be in a position to announce its decisions regarding the approval of the NAPs. In reality, the Commission's NAP approval process was subject to considerable delay because of late submissions by many Member States on the one side,[254] because of contention between Brussels and the individual Member State with respect to the Member State's emission caps on the other side.[255] Several Member States have brought legal challenges before the European Court of First Instance. Nine Member States have contested the

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249 Article 27, paragraph 1b) of the Consolidated ETS-Directive.

250 Article 9, paragraph 1 of the Original ETS-Directive.

251 ELLERMAN/JOSKOW, 31, referring to PETER ZAPFEL in: DENNY A. ELLERMAN/BARBARA BUCHNER /CARLO CARRARO, *"Allocation in the European Emission Trading Scheme; Rights, Rents and Fairness"*, Cambridge/New York, 2007.

252 Article 9, paragraph 3 of the Original ETS-Directive.

253 DE SÉPIBUS, Linking, 2008, 4; ERLING, 23. There is no Annex III in the Consolidated ETS-Directive any more.

254 CONVERY/REDMOND, 92; ELLERMAN/JOSKOW, 9. Austria, Denmark, Finland, Germany, Ireland, and the Netherlands were the only countries that met the deadline. The plan for the last Member State, Greece, was not approved until June 2005, six months after the pilot period had begun.

255 ELLERMAN/JOSKOW, 10.

Commission's significant reduction in the emission caps proposed by these Member States, all of the initial East European accession countries except for Slovenia. Their primary argument was that the Commission's methodology to determine Member States' totals is inappropriate to their circumstances either because they are small or because the ongoing structural transformation of their economies has not been properly taken into account.[256]

Two of these applications for the annulment of the Commission decisions relating to other Member States have been ruled on by the Court so far. Both decisions rejected the Commission's rejections of the NAPs of Poland and of Estonia arguing that the Commission has exceeded its powers.[257]

Despite the adjustments by the Commission, phase I and phase II experienced an overall amount of emission units that have been allocated generally considered excessive, a phenomenon known as *"over-allocation"*.[258] Indeed, for the entire trading period extending from 2005 to 2007, the EU-ETS had allocated about 5.6 per cent more emission units than needed to cover emissions.[259] However, in addition to the modest ambition for emission reductions during the trial period, the difficulty of choosing an appropriate Member State total was further compounded by a cluster of *"technical"* problems associated with data, sector definitions, and the use of projections.[260] These

256 ELLERMAN/JOSKOW, 10.

257 Case T-183/07 Poland v. European Commission; Case T-263/07 Estonia v. European Commission. The importance of the Court assessments derives – inter alia – from the fact, that they were adopted by two different compositions of judges. Another interesting case in the context of the EU global warming policy case-law was Case T-384/04, Germany v. Commission, making a true environmental consideration in the judges' interpretation apparent. The Federal Republic of Germany had included the possibility of reviewing the number of emission units allocated to a covered installation and, if necessary, to lower the number of emission units allocated. The Commission refused a downward modification of the EU emission units because it was an ex-post adjustment. The Court, finally, clearly rejected the Commission's position to refuse a downward modification of the EU emission units only because it was an ex-post adjustment. With this decision, the Court's case-law privileges the environmental objective, supported by the reduction of emission units, over procedural aspects. See VAN AKEN, 109/110.

258 WOERDMAN/CLÒ/ARCURI, 129.

259 MCALLISTER, 410, Table 4, compiled after information from Press Release, "*European Community Emissions trading: 2007 verified emissions from EU-ETS businesses*", 23 May 2008, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/787>.

260 ELLERMAN/JOSKOW, 32.

problems are decreasing with the second and post 2012-periods since verified data for earlier years have been determined in the meantime.

The cap of phase II, the period from 2008 to 2012, finally, ended up to be about 13 per cent lower on an annual average basis than the phase I cap and 6 per cent lower than comparable 2005 emissions.[261] As of phase III, the current system of fixing 27 national caps on emissions from the ETS sectors will be replaced by a single EU-wide cap. On 9 July 2010, the Commission has communicated the cap for 2013 being just under 1.927 billion emission units.[262] This Community-wide quantity of emission units shall decrease in a linear factor of 1.74 per cent compared to the average annual total quantity of emission units.[263] The linear factor shall be reviewed as from 2020, with a view to the adoption of a decision by 2025.[264]

However, the cap for 2013 is not definitive yet. The decision is based on Member States' NAPs for the period 2008 to 2012 and therefore reflects the current scope of the EU-ETS. It will need to be adjusted to reflect the extended scope the system will have from 2013 when new sectors and gases will be covered.[265] This adjustment will also need to take account of the fact that new installations have been opted into the EU-ETS in the period from 2008 to 2012 under the provisions of the revised Directive.

Final figures for the 2013 cap may thus not be available before 2013. However, in order to keep the public informed, the Commission will update the figures in due time.[266]

3.4.3 New Entrants Reserve (NER)

The New Entrants Reserve (NER) is a pool of emission units set aside to enable Member States to allow new installations to enter the EU-ETS. The NER is also supposed to receive the emission units of any installations closing down which no longer require their allocated emission units. During

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261 McAllister, 410; Ellerman/Joskow, 34.

262 The average annual total amount of EUAs for the period from 2008 to 2012 being calculated at 2,032,998,912 EUAs and subtracting 1.74 per cent thereof (35,374,181 EUAs) equals the cap for 2013 at 1,926,876,368 EUAs.

263 Article 9, paragraph 1 of the Consolidated ETS-Directive.

264 Article 9, paragraph 3 of the Consolidated ETS-Directive.

265 Article 9a, paragraph 1 of the Consolidated ETS-Directive.

266 These up-dates, however, are expected to only bring about marginal changes and are not supposed to affect the overall quantity of emission units prevailing from 2013 onwards.

2008 countries did not make full use of their NER emission units. Indeed, the NER pot is likely to be gaining emission units faster than it can disburse them with recession making plant closures far more likely than plant openings.[267] There are estimates that there will be probably over 300 million surplus emission units in the NER by 2012.[268]

3.4.4 The Allocation Process

The term *"allocation"* is frequently used to refer to both cap-setting within the scheme and the distribution of emission units by the Member States to covered installations.[269] This thesis uses the term allocation only for the distribution of emission units to covered installations.

In general terms, there are three methods of allocation: *"Grandfathering"*, *"benchmarking"* and *"auctioning"*. In the grandfathering system, calculations are based on historical emissions data. Although in the beginning politically best acceptable, it is an unsatisfactory method of allocating emission units because it favours installations with higher emissions in the past over more efficiently working installations.[270] Efforts to reduce emissions through technological innovation or greater efficiencies are discouraged, as this carries the risk of receiving a lower allocation of EUAs.[271] In addition, the system pushed Member States to over-allocate emission units to in-state firms providing them an opportunity to become net sellers to the carbon market.[272]

With the benchmarking method, the capacity of a plant is multiplied by a benchmark factor such as standard emissions per unit of power generated or best available technology. This method offers incentives for firms to invest in energy efficiency measures and to improve carbon efficiency. However,

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267 SANDBAG, 9.

268 SANDBAG, 9, referring to DEUTSCHE BANK, "*How Long is a Piece of String?*", 26 May 2009.

269 ELLERMAN/JOSKOW, 35.

270 GILBERTSON/REYES, 86, Fn. 7, referring to JOS DEBELKE, Deputy Director DG Environment of the European Commission, responsible for the implementation of the ETS. Delbeke declared in 2009: *"Wir sind nach dem Prinzip vorgegangen, die kostenlosen Zertifikate entsprechend den bereits erfolgten Emissionen zu vergeben. Das hatte den Nachteil, dass die weniger effizienten Anlagen bevorteilt wurden."* JOS DEBELKE, Written statement to Hearing by the Senate Committee on Finance on "*Auctioning under Cap and Trade: Design, Participation and Distribution of Revenues"*, 7 May 2009, 6.

271 KAMINSKAITE-SALTERS, 327.

272 DE SÉPIBUS, Linking 2008, 2.

benchmarks in manufacturing can become highly complex, given the wide range of products and production processes.[273]

The method of auctioning, finally, offers the purest incentives. Since all actors face the full costs of carbon, it ensures that price signals remain intact to facilitate efficient corporate and private decisions on consumption, innovation and low-carbon investment.[274]

Auctioning is very popular among the supporters of cap-and-trade schemes puzzled by the magnitude of the *"windfall profits"*[275] of the first phase of the EU-ETS. However, on the basis of calculations with a numerical case study, FEHR concludes that auctions cannot lower windfall profits to a reasonable level. They merely help the redistribution of the costs.[276] Taking into account the considerable transactional costs in the case of auctioning, this seems to be a reasonable assumption. Auctioning will require a relatively higher administrative burden for small emitters than for large emitters. Therefore, auctioning bears the risk of an unfair distribution of burden.

The applied method of allocation in phase I varied from Member State to Member State.[277] As stated in Article 10 of the Original ETS-Directive, every Member State was required to allocate at least 95 per cent of the emission units free of charge for the period of 2005 to 2007, and at least 90 per cent of the emission units free of charge for the five year period 2008 to 2012. According to the ETS-Directive, the distribution of emission units had to be based "*on average emissions of GHG by product in each activity and achievable progress in each activity"*.[278] Thereby, the total quantity of emission units to be allocated shall be "*consistent with assessments of actual and projected progress towards fulfiling the Member States' contributions to the Community's commitments"*.[279]

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273 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 17/18.

274 For a discussion of the various allocation methodologies see GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 15-19.

275 *"Windfall profits"* are additional profits that operators in certain sectors, such as the power sector, make by passing on the market value of EUAs to energy consumers while obtaining EUAs for free.

276 FEHR, 143/4.

277 Article 9, paragraph 3 of the Original Directive 2003/87/EC. GILBERTSON/REYES, 58, use the term *"Vergabe-Lotterie"* to characterize the system.

278 Annex III, paragraph 3 of the Original ETS-Directive.

279 Annex III, paragraph 2 of the Original ETS-Directive.

Consequently, most Member States allocated emission units in phase I to sources according to their historical emissions during recent years ("*grandfathering*") and distributed emission units free of charge. Only Denmark, Hungary, Lithuania and Ireland chose to auction a modest part of their respective totals.[280]

In the second trading period, Member States were allowed to auction up to 10 per cent of their allocations. However, less than 4 per cent of emission units EU-wide have been auctioned.[281] The allocations for phase II were negotiated against the realization that there was a great deal at stake, with phase I having shown the huge financial value of emission units, potentially more than 200 billion EUR in total over the five years of phase II. Not surprisingly, governments were subject to enormous lobbying pressures.[282] WRÅKE summarizes that the allocation procedures in phase I and II have been *"complex and opaque"*, having "*damaged the perceived fairness of the trading system by the public"*.[283]

As of phase III, the system is drastically centralized to avoid inconsistencies and remove the need for separate and interdependent negotiations in EU Member States. A principle of 100 percent auctioning is established and free allocation to the power sector abolished as of 2013. Free allocation in other sectors will be reduced from 80 per cent in 2013 to 30 per cent in 2020 and eventually to zero in 2027.[284]

Commission Regulation No. 1031/2010 of 12 November 2010 governs the auctioning of emission allowances.[285] The Regulation provides for Member

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280 ELLERMAN/JOSKOW, 38. Denmark: 5 per cent; Hungary: 2.5 per cent; Lithuania 1.5 per cent; Ireland: 0.75 per cent.

281 EUROPEAN COMMISSION, MEMO/10/338, 16 July 2010, Question 2, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/338&type=HTML>.

282 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12.

283 WRÅKE, 9.

284 EUROPEAN COMMISSION, "*EU Action against Climate Change*", 2009, 11. See also EPINEY, 238, arguing that Articles 10a, 10b, 10c of the Consolidated ETS-Directive provide for so many exceptions that auctioning may be the rule only as of 2027.

285 Commission Regulation No. 1031/2010 of 12 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emissions allowances pursuant to Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowances trading within the Community, OJ L 302/1, 18.11.2010, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri

States and the Commission to procure jointly a common platform to auction EUAs ensuring respect of the principles of non-discrimination, transparency and simplicity. Nevertheless, Member States may appoint an auction platform of their own, since the Regulation provides for adequate rules as to the functioning of such auction platforms and the coordination with the common auction platform. Germany, Poland and the United Kingdom have informed the Commission that they intend to opt out of the planned common platform for auctioning EUAs for phase III of the EU Emission Trading Scheme starting in 2013. Each of these countries will instead appoint its own auction platform.[286]

The resulting revenues from auctioning are assigned to Member States. They shall determine the use to be made of revenues generated from the auctioning of emission units within a vaguely defined set of activities.[287] The revised ETS-Directive specifies the rules more precisely: At least 50 per cent shall be used for one of nine proposed activities.[288]

3.4.5 Windfall Profits, Over-Allocation and Carbon Leakage

Grandfathering as an alloction-method has been largely criticized for two reasons. Firstly, phase I has suffered from an over-allocation. The gap between effected emissions and emission units available raises the question of whether the EU-ETS cap based on a grandfathering-allocation can be stringent enough. [289] Secondly, opponents of the grandfathering option argue that the free allocation of EUAs contradicts the "*polluter-pays*" principle as stipulated in Article 174, paragraph 2 of the EC Treaty.[290] Grandfathering has

=OJ:L:2010:302:0001:0041:EN:PDF>. A Regulation is the strongest form of EU legislation and the rules are directly applicable in all Member States.

286 Information according to the European Commission's website, available at <http://ec.europa.eu/clima/policies/ets/auctioning_third_en.htm>.

287 Article 3d, paragraph 4 of the Consolidated ETS-Directive, introduced with the Aviation-Directive.

288 Article 10 of the Consolidated ETS-Directive. These nine activities include, among others, the Global Energy Efficiency and Renewable Energy Fund and the Adaptation Fund as made operational by the Posnan Conference on Climate Change (COP 14, CMP 4), to develop renewable energies and to cover administrative expenses of the management of the Community.

289 WOERDMAN/CLÒ/ARCURI, 129.

290 POHLMANN, 357; WOERDMAN/CLÒ/ARCURI, 128/129.

created the opportunity that so-called "*windfall profits"* can accrue. Windfall profits are additional profits for operators in certain sectors, such as the power sector, achieved by passing on the market value of EUAs to energy consumers while obtaining EUAs for free.

Proponents of the grandfathering option, by contrast, argue that the increase of EU-ETS compliance costs caused by auctioning could put energy-intensive industries at a competitive disadvantage as compared with non-EU industries, resulting in the relocation of such industries outside of the EU. This phenomenon of carbon-intensive industry moving to locations with low shadow prices for carbon is known as *"carbon leakage"*.[291]

With regard to phase III starting in 2013, Member States have pushed successfully for certain exclusions in the final version of the amended ETS-Directive to address, in particular, special national circumstances and the risk of carbon leakage in certain sectors and sub-sectors. Article 10a of the Consolidated ETS-Directive provides for transitional community-wide harmonised rules allocating free emission units in principle based on product-specific benchmarks for each relevant product.[292] In 2013 and in each subsequent year up to 2020, installations *"in sectors or subsectors which are exposed to a significant risk of carbon leakage"* shall be allocated emission units free of charge at 100 per cent of the quantity determined in accordance with the Community-wide harmonised rules for free allocation.[293]

According to estimations, more than half of the 258 sectors or subsectors defined so far will be able to receive free emission units claiming that the costs resulting from the implementation of the Directive into product prices

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[291] METCALF/WEISBACH, 1.

[292] Commission Decision of 27 April 2011 determining transitional Union-wide rules for harmonized free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC of the European Parliament and of the Council, 2011/278/EU, OJ L 130, 17.05.2011, 0001-0045, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:130:0001:01:EN:HTML>.

[293] Article 10a, paragraph 12 of the Consolidated ETS-Directive. Would the Consolidated ETS-Directive be applied to installations in Switzerland, the large majority of installations would belong to a sector or subsector considered to be *"exposed to a significant risk of carbon leakage"* and, consequently, benefit from the free allocation of emission units. FIRST CLIMATE/ECONABILITY, 57.

will lead to a significant loss of market share compared to less carbon efficient installations outside the Community.[294]

Even more so, EPINEY assumes that Articles 10a, 10b and 10c of the Consolidated ETS-Directive provide for so many exceptions that auctioning may be the rule only as of 2027.[295]

3.5 Aviation

Emissions from transport in Europe have grown by approximately 34 per cent in the period from 1990 to 2004.[296] Emissions from aviation are growing faster than from any other sector, and all forecasts indicate that they will continue to do so under business-as-usual conditions.[297] Therefore, in its report *„Building a Global Carbon Market"* of November 2006, the European Commission announced its intention to expand the EU-ETS Directive's scope to other sectors and activities such as aviation, transport and shipping.

The Aviation-Directive of 19 November 2008, introducing Articles 3a to 3g into the Consolidated ETS-Directive, provides for the incorporation of aviation, while shipping or transport within the scope of the EU-ETS was deemed premature without further analysis and pending international discussions.

The Aviation-Directive built on the experience of the EU-ETS avoiding the pitfalls of the Original ETS-Directive. It is hoped that the framework for aviation emission trading will thus be more effective than the EU-ETS in the first two phases of its operation.[298]

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294 See Europe's Environmental News and Information Service (ENDS) EUROPE DAILY, "*Huge array of sectors to get free ETS allowances"*, 8 May 2009, available at <http://www.endseurope.com/21302/huge-array-of-sectors-to-get-free-ets-allowances?referrer=channel per cent2Dclimate>.

295 EPINEY, 238.

296 KAMINSKAITE-SALTERS, 323, Fn. 5. Data based on the *"Annual Environment Assessments"* of the European Environment Agency (IEA).

297 EUROPEAN COMMISSION, Press Release of 7 March 2011, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/259>.

298 KAMINSKAITE-SALTERS, 342.

Emissions from international flight traffic are not covered by the Kyoto Protocol.[299] The Kyoto Protocol to the UNFCCC requires developed countries to pursue the limitation or reduction of emissions of GHG not controlled by the Montreal Protocol from aviation working through the International Civil Aviation Organization (ICAO).[300] However, at an ICAO Committee on Aviation Environmental Protection meeting in 2004, it was agreed that an aviation-specific Emission Trading Scheme seemed unattractive and that it should not be pursued further.[301]

The newly introduced European Union Aviation Allowances (EUAA), hence, do not correspond to an AAU.[302] EUAAs are, consequently, not equivalent to EUAs. Technically speaking, the incorporation of aviation into the EU-ETS is a direct unilateral link between the EU-ETS and the aviation sector as it is the case with Clean Development Projects under the CDM.

All flights which arrive at or depart from an aerodrome situated in the territory of a Member State shall be included in the EU-ETS.[303] Flights with a weight under 5'700 kg are not covered. Further exceptions are, among others, flights performed exclusively for official missions, military flights, search and rescue flights, flights for training and scientific research and flights performed by small operators.

All the airlines landing and starting on EU airports are addressed, including non-EU airlines. The reason for this provision is to avoid competition distortions: *"In order to avoid distortions of competition and improve environmental effectiveness, emissions from all flights arriving at and departing from Community aerodromes should be included from 2012"*.[304]

The Commission may exclude flights arriving from third countries from the aviation activities listed in Annex I, if a third country adopts measures for reducing the climate change impact of these flights and if these measures are deemed to be sufficient by the Commission and the Member States of the EU.[305]

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299 KAMINSKAITE-SALTERS, 333/334. By contrast, domestic aviation is included within the Kyoto targets.

300 Cited in preamble, recital 8 of the Aviation-Directive.

301 Preamble, recital 9 of the Aviation-Directive.

302 FIRST CLIMATE/ ECONABILITY, 79.

303 Annex I, paragraph 6 of the Consolidated ETS-Directive.

304 Preamble, recital 16 of the Aviation-Directive.

305 Article 25a, paragraph 1 of the Consolidated ETS-Directive.

Article 30 of the Consolidated ETS-Directive asks the Commission to review, by 1 December 2014, the functioning of the Directive in relation to aviation activities and to make proposals considering, among others, the implications and impact as regards the overall functioning of the Community scheme and the functioning of the aviation emission units market.[306]

3.5.1 Cap-Setting in the Aviation Sector

Instead of Member States allocating a CO_2 emissions cap for its respective aviation sector on national level, the Aviation-Directive includes an EU-wide CO_2 emissions cap-setting mechanism for the aviation sector at EU-level.[307] The EU-wide cap is to be calculated by reference to a baseline of historic average CO_2 emissions from aviation in the EU.[308] As a baseline, the average of the annual emissions in the period 2004 to 2006 was chosen.[309] For the period from 1 January 2012 to 31 December 2012, the total quantity of emission units to be allocated to aircraft operators shall be equivalent to 97 per cent of the historical aviation emissions[310] and 95 per cent each year from 2013 onwards.[311]

The ETS-Directive provided for a decision on the historical aviation emissions by the Commission by 2 August 2009.[312] This decision on historical aviation emissions data was finally published by the Commission on 7 March 2011, defining the amount of 219,476,343 tCO_2e as average of the estimated annual emissions for the years 2004, 2005 and 2006 of all flights that would be covered by the EU-ETS performed by aircraft operators to and

306 Article 30, paragraphs 4a), 4b) and 4c) of the Consolidated ETS-Directive.

307 POHLMANN, 346; KAMINSKAITE-SALTERS, 330

308 Article 3, lit. s) of the Consolidated ETS-Directive: *"(...)'historical aviation emissions' means the mean average of the annual emissions in the calendar years 2004, 2005 and 2006 from aircraft performing an aviation activity listed in Annex I."*

309 According to KAMINSKAITE-SALTERS, 330, the choice of the period 2004 to 2006 still lacks a reasonable justification.

310 Article 3c, paragraph 1 of the Consolidated ETS-Directive.

311 Article 3c, paragraph 2 of the Consolidated ETS-Directive.

312 Article 18b of the Consolidated ETS-Directive provides for the Commission to request the assistance of the European Organisation for the Safety of Air Navigation (Eurocontrol) or another relevant organization for the purposes of deciding on historical aviation emissions data. Article 3c, paragraph 4 of the Consolidated ETS-Directive asks the Commission to decide on the historical aviation emission by 2 August 2009.

from European airports.[313] As a result, the total EU aviation cap for the period from 1 January 2012 to 31 December 2012 enlarges the EU-ETS volume by more than 10 per cent.

3.5.2 The Allocation Process in the Aviation Sector

The European Commission provides for a single method of allocation of EUAAs laid out in a respective Regulation.[314] With this Regulation, the European Commission makes sure that the process is harmonized all over the Member States to avoid the experience of the multitude of allocation methods which governed phase I and phase II of the EU-ETS.[315]

According to the Consolidated ETS-Directive, 15 per cent of the aviation emission units for the compliance period 2012 shall be auctioned.[316] The vast majority of EUAAs, however, will be allocated free of charge.

For the compliance period as of January 2013, at least 15 per cent of the EUAAs shall be auctioned.[317] Three per cent will be hold back as a reserve in order to allow new aircraft operators to enter the EU-ETS.[318] The rest, namely 82 per cent of the total EUAAs, will be allocated free of charge. Based on information submitted by the Member States, the European Commission will calculate the benchmark that will define how many free emission units aircraft operators will receive.

Aircraft operators were obliged to monitor and verify their emissions since 1 January 2010. By 31 March 2011, each operator could apply for allocation covering compliance period 2012 based on their verified activities in 2010.[319] Based on information submitted by the Member States, the European Commission will calculate the benchmark that will define how many free emission units aircraft operators will receive. This benchmark decision together with the emissions cap and the percentages of EUAAs to be auc-

313 EUROPEAN COMMISSION, Press Release of 7 March 2011, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/259>.

314 Article 3d, paragraph 3 of the Consolidated ETS-Directive.

315 KAMINSKAITE-SALTERS, 327.

316 Article 3d, paragraph 1 of the Consolidated ETS-Directive.

317 Article 3d, paragraph 2 of the Consolidated ETS-Directive.

318 Article 3f of the Consolidated ETS-Directive. According to KAMINSKAITE-SALTERS, 330/331, the provisions relating to new entrants, however, still raise a number of issues that remain to be clarified.

319 Article 3e, paragraph 1 of the Consolidated ETS-Directive.

tioned, given for free and allocated to the special reserve, will be published by 30 September 2011.[320]

In summary, the aviation provisions are considerably more harmonized and transparent than the current EU-ETS. With this harmonization, the European Commission hopes to increase predictability which is necessary for aircraft operators to prepare for the inclusion into the EU-ETS. Moreover, by rejecting grandfathering in favour of benchmarking and placing greater reliance on auctioning, the scheme hopefully creates the necessary level of scarcity of emissions units.[321]

3.5.3 Questioned Legality under International Law

The inclusion of aviation into the EU-ETS has provoked harsh criticism by the aviation industry.[322] Third country airlines are of the opinion that the inclusion of their airlines into the EU-ETS is illegal under international law because it is an extra-territorial application of EU policy on non-EU carriers. Furthermore, the unilateral expansion of the EU-ETS to aviation is considered to be an improper tax or charge contradicting international law.[323] Lately, China and representatives of the International Air Transport Association (IATA) have pronounced threats to retaliate, whether in the form of imposing additional taxes on European airlines or restricting access to markets.[324]

On 16 December 2009, United Airlines, Continental Airlines and American Airlines, supported by the Air Transport Association of America (ATA), filed an application for judicial review to the High Court of Justice Queen's Bench Division (Administrative Court) in the United Kingdom. The primary concern for the applicants is that the EU-ETS may be in breach of the Article

320 KAMINSKAITE-SALTERS, 328/329.

321 KAMINSKAITE-SALTERS, 328/239.

322 See POHLMANN, 347, Fn. 44.

323 NANCY N. YOUNG, Vice President of Environmental Affairs at ATA, cited in *"ATA gains permission to challenge EU Emission Trading Scheme"*, published on 28 May 2010, available at <http://www.defensefile.com/Customisation/News/Education_Training_and_Professional_Services/Institutes_Trade_Associations_and_Professional_Bodies/ATA_Gains_Permission_to_Challenge_EU_Emission_Trading_Scheme.asp>.

324 *"Aviation chiefs step up their attacks on the EU ETS as Europe's climate commissioner stands firm on airline inclusion",* published on 8 June 2011, available at <http://www.greenaironline.com/news.php?viewStory=1249>.

1 of the Convention of International Civil Aviation, which states that countries have sovereignty over the airlines in their own airspace. [325]

Asked on the validity of the amended ETS-Directive, the High Court of Justice made reference for a preliminary ruling to the European Court of Justice in Luxembourg (ECJ).[326] The key question referred to is whether the ETS-Directive as amended by the Aviation-Directive is invalid, insofar as it applies the EU-ETS to aviation activities, as contravening to the provisions of the Chicago Convention[327] and of the Kyoto Protocol.[328] On 6 October 2011, the ECJ released an opinion of the Court's Advocate General suggesting that the EU's plan to extend the ETS to aviation does not interfere with the sovereignty of third countries and complies with all relevant aviation agreements.[329]

Even if ATA has seemingly lost its bid at the ECJ, they could choose to intensify their lobbying efforts in Washington to achieve a formal WTO complaint. The dispute over its legality is likely to continue, but the Aviation-Directive is already now reaching its aim by effectively changing the behaviour of airports and airlines around the world.[330]

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325 Convention on International Civil Aviation (also known as Chicago Convention), signed on 7 December 1944, available at <http://www.icao.int/icaonet/dcs/7300_cons.pdf>.

326 The reference for a preliminary ruling is a procedure exercised before the Court of Justice of the European Union. This procedure enables national courts to question the Court of Justice on the interpretation or validity of European law. The Court of Justice therefore only gives a decision on the constituent elements of the reference for a preliminary ruling made to it. The national court therefore remains competent for the original case. See <http://europa.eu/legislation_summaries/institutional_affairs/decisionmaking_process/l14552_en.htm>.

327 Art. 1 of the Chicago Convention of 1944 (SR 0.748.0) states: *"The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory"*.

328 Article 2, paragraph 2 of the Kyoto Protocol states: *"The Parties (...) shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation (...) working through the International Civil Aviation Organization (...)"*.

329 COURT OF JUSTICE OF THE EUROPEAN UNION, Press Release No 104/11 of 6 October 2011, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=CJE/11/104&format=HTML&aged=0&language=EN&guiLanguage=en>.

330 For example, Lufthansa is the first airline to be registered as a trading partner in the EU-ETS at the Energy Stock Exchange EEX in Leipzig. See 24PR INTERNETZEITUNG of 19 April 2011, available at <http://www.24pr.de/article/Lufthansa+beteiligt+sich+an+CO_2-Zertifikate-Handel/112523.htm>. See also BARTLIK, 224.

3.6 Definition and Recognition of Trading Units

3.6.1 Measurement of a Trading Unit

In line with the provisions in the Kyoto Protocol, all tradable units within the EU-ETS have the same unit of *"one metric tonne of carbon dioxide equivalent"*, translated into *"tCO_2 equivalent"* or, in short, *"tCO_2e"*.[331]

The EU-ETS introduces the term European Union *"Emission Allowances"* (EUA) defined as *"an allowance to emit one tonne of carbon dioxide equivalent during a specified period, which shall be valid only for the purposes of meeting the requirements of this Directive and shall be transferable in accordance with the provisions of this Directive".*[332] An emission allowance within the EU-ETS is abbreviated as an EUA and is valid for emissions during the entire trading period in which it is issued.[333] Emissions from international flight traffic are not covered by the Kyoto Protocol.[334] Therefore, the newly introduced European Union Aviation Allowances (EUAAs) do not correspond to an AAU.[335]

The emission units of the EU-ETS have the same unit of measurement as the Kyoto Protocol. However, an EUA may not be applied in the same way as an Assigned Amount Unit (AAU), the emission unit attributed to Annex B-Parties of the Kyoto Protocol. AAUs are what Annex B-Parties receive according to their Article 3.1-commitment. From this AAU budget, European Annex B-Parties may convert a certain amount into EUAs and distribute it to entities covered by the ETS-Directive. An EUA, therefore, is a specific emission unit, an AAU designated as valid for trading under the EU-ETS.[336]

Since only a part of the total national AAU budget is converted into EUAs and allocated to participants in the EU-ETS, the remaining AAUs have to be

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331 Almost all systems currently emerging do in fact rely on the same quantitative unit of trading based on the Kyoto Protocol. The one exception is the RGGI system which would be based on short tons, which is less than a metric tonne (namely 907.18474 kg). SCHÜLE/STERK, 12.

332 Article 3 of the Original and Consolidated ETS-Directive.

333 Article 3, subparagraph (a) of the Original ETS-Directive, unchanged in the Consolidated ETS-Directive.

334 KAMINSKAITE-SALTERS, 333/334. By contrast, domestic aviation is included within the Kyoto targets.

335 FIRST CLIMATE/ ECONABILITY, 79.

336 BAZELMANS, 300.

allocated to Non EU-ETS-entities in order to achieve compliance with the Article 3.1-committment.

The same is not true for EUAAs. The Aviation-Directive gives aircraft operators full access to the EU-ETS. Aircraft operators may buy EUAs without trading restriction.[337] Stationary installations covered by the EU-ETS, however, are not allowed to use aviation emission units for compliance purposes.[338]

3.6.2 Legal Nature of a Trading Unit

Like the Kyoto emission units, EUAs are, on the one hand, accounting units which are traced and recorded through national registries. On the other hand, they are also tradable instruments representing an entitlement to release a certain quantity of GHG emissions into the atmosphere and are as such transferable under certain established conditions.[339] There is a tendency for emission units to be treated as commodities. But there are elements which make emission units an asset akin to a currency.[340]

According to the EU-principle of subsidiarity, the EUAs legal status is to be decided by each EU Member State in the context of its respective national laws.[341] However, some legal characteristics apply EU-wide.

The legal characteristics of an EUA may, according to POHLMANN, be generally viewed as "*property rights*".[342] As a publicly issued but privately trad-

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337 Article 12, paragraph 2a of the Consolidated ETS-Directive: *"Administering Member States shall ensure that (...) each aircraft operator surrenders a number of allowances equal to the total emissions during the preceding calendar year from aviation activities (....)"*.

338 Article 12, paragraph 3 of the Consolidated ETS-Directive: *"Member States shall ensure that, (...) the operator of each installation surrenders a number of allowances, other than allowances issued under Chapter II, equal to the total emissions from that installation during the preceding calendar year(....)"*. Chapter II of the Consolidated ETS-Directive contains the provisions concerning aviation.

339 WEMAERE/STRECK/CHAGAS, 37; ZUMBACH, 33-37.

340 For a comprehensive overview see BUTTON.

341 ZUMBACH, 33.

342 POHLMANN clarifies that the term *„property rights"* is not identical with private ownership but is an economic concept to define a certain (more or less limited) bundle of rights attached to the use of a public good. POHLMANN, 351, Fn. 65. On the question of property rights, see also WEMAERE/STRECK/CHAGAS, section 3.1. *"The ethical dimension"*, 37-40.

able asset with the objective of helping EU Member States to manage a public good and comply with its international emission reduction obligations, an EUA has a unique dual (public-private) character that does not seem to fit easily into existing national legal terms.[343]

In addition, the Registry Regulations allow EU Member States to permit a holder of an EUA to use it as a security.[344] EUAs can be held by any person with an account in a national emission registry, allowing its holder to emit one tonne of CO_2e into the atmosphere. An EUA can be transferred to another person's national emission registry account either within the EU or in a third country that recognizes EUAs, provided that the transfer is not blocked or suspended in accordance with the Registry Regulation. In accordance with the Registry Regulations, EUAs can be surrendered and cancelled.[345]

EU Member States themselves have described or defined EU emissions units with different degrees of clarity and legal authority.[346] The range of descriptions among EU Member States include a *"commodity"*,[347] an *"intangible property right or asset"*,[348] a *"financial instrument"*,[349] a *"transferable 'right'"*,[350] a "*transferable pecuniary right"*,[351] a *"transferable 'right' or 'authorization' to emit"*[352] and an *"asset"*.[353]

In the context of global convergence of different markets through linking, BUTTON highlights that it is important for governments to seek consensus as to the legal characteristics of the basic unit of exchange in this market. The model ultimately adopted should reflect the economic substance of interna-

343 POHLMANN, 352.

344 Article 19, paragraph 2 of Commission Regulation 994/2008/EC of 8 October 2008 for a standardised and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision No 280/2004/EC of the European Parliament and of the Council, OJ L 271/3, 11.10.2008, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:271:0003:0003:EN:PDF>.

345 POHLMANN, 351.

346 MACE ET AL., 95. See also M. J. MACE, *"The Legal Nature of Emission Reductions and EU Allowances: Issues Addressed in an International Workshop"*, Journal for European Environmental & Planning Law, Number 2, 2005.

347 Austria, Germany, Italy, Portugal, Spain. For Germany, see also ZUMBACH, 33/34.

348 Finland, France, Netherlands. For France, see also ZUMBACH, 34.

349 Estonia, Netherlands, Sweden.

350 Germany.

351 Hungary.

352 Belgium, Czech Republic, Denmark, Ireland, Luxembourg.

353 Cyprus.

tional emission trading while not compromising the environmental integrity of the system.[354]

3.6.3 Offsetting from Abroad - Linking with *"Kyoto"*

The Original ETS-Directive did not include the possibility for operators to use Kyoto emission units for compliance. But it stressed the fact that project-based mechanisms including Joint Implementation (JI) and Clean Development Mechanism (CDM) are important to achieve the goals of both reducing global GHG emissions and increasing the cost-effective functioning of the Community scheme.[355]

It is the Linking-Directive adopted on 27 October 2004 that allows operators to use CERs and ERUs directly "*to offset"*[356] their reduction obligations under the ETS-Directive.[357] In its original draft, the Linking-Directive had not included the possibility for operators to use Kyoto emission units for compliance under the EU-ETS directly. In order to have the purchased CER or ERU accounted to the reduction obligation of the entity, the CER/ERU first had to be conversed into an EUA. The conversion would have allowed the Member States to impose other criteria for the conversion of Kyoto emission units into EUAs.[358]

3.6.3.1 The Issue of Double-Counting

The Consolidated ETS-Directive foresees that Member States hosting project activities shall ensure that no CERs/ERUs are issued for compliance of installations covered by the EU-ETS unless an equal number of EUAs is can-

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354 BUTTON, 571.

355 Preamble, recital 19 of the Original and Consolidated ETS-Directive.

356 "*To offset"* is to compensate for GHG emission occurring in the EU by acquiring emission units which certify the reduction, removal, or avoidance of GHG emissions by a project outside of the EU. In the literature, the terms *"offset"* or *"credit*" are often used for compensating emission units effected elsewhere.

357 Article 11a, paragraph 2 of the Linking-Directive: *"Member States may allow operators to use CERs from project activities in the Community scheme. This shall take place through the issue and immediate surrender of one allowance by the Member State in exchange for one CER."*

358 DE SÉPIBUS, Linking, 2008, 5, Fn. 25, referring to JÜRGEN LEFEVERE, "*Linking Emissions Trading Schemes: The EU ETS and the Linking Directive*", in: DAVID FREESTONE /CHARLOTTE STRECK (eds), *"Legal aspects of implementing the Kyoto Protocol mechanisms: making Kyoto work"*, Oxford 2005, 511-533, 524.

celled by the operator of that installation and only if an equal number of emission units is cancelled from the national registry of the Member State of the ERU's origin.[359] These provisions aim at avoiding the so-called *"double counting"*, when CDM/JI projects in accordance with Kyoto Protocol rules are used for compliance under the EU-ETS while at the same time also generating CERs/ERUs to be used for compliance under the Article 3.1 commitment of the Kyoto Protocol.[360] CERs, originating in Non-Annex B-Parties which are, by definition, host countries without emission reduction targets, do not have an AAU budget and, therefore, have no emission units to cancel.

There are a number of qualitative restrictions on the type of Kyoto projects whose emission units are eligible in the EU-ETS. Thus, in line with the Marrakesh Accords, emission units from nuclear facilities are excluded.[361] Contrary to the provisions of the Kyoto carbon market, emission units from sink projects are not eligible due to concerns about the permanence of the achieved carbon sequestration.[362] Finally, taking into account concerns about possible negative social and environmental consequences, hydroelectric power production project activities with a generating capacity exceeding 20 megawatt, have to be paid special attention to. Member States must ensure that relevant international criteria and guidelines are respected during the development of such project activities.[363]

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359 Article 11b, paragraphs 3 and 4 of the Consolidated ETS-Directive.

360 The measures against double counting are specified in further detail in Commission Decision 2006/780/EC on 13 November 2006 on avoiding double counting of greenhouse gas emission reductions under the Community emissions trading scheme for project activities under the Kyoto Protocol pursuant to Directive 2003/87/EC of the European Parliament and of the Council, available at <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:316:0012:0017:EN:PDF>.

361 Article 11a, paragraph 3, subparagraph a) of the Linking-Directive.

362 Article 11a, paragraph 3, subparagraph b) of the Linking-Directive. Sinks are sectors and projects able to remove CO_2 out of the atmosphere by the sequestration of carbon. Sinks are, for example, projects summarized under LULUCF (land use-, land use change- and forestry-projects, including afforestation and reforestation) and under REDD-plus (reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forest; and enhancement of forest carbon stocks). Contrary to the EU-ETS, *"afforestation and reforestation"* projects are CDM eligible in the Kyoto carbon market. Decision 17/CP.7, paragraph 7.

363 Article 11b, paragraph 6 of the Linking-Directive, introduced on the insistence of the European Parliament. See DE SÉPIBUS, Linking, 2008, 6, Fn.33.

3.6.3.2 The Issue of Supplementarity

While drafting the Linking-Directive, the Member States expressed the intention to quantitatively restrict the use of offsets from abroad to ensure that the use of project-based emission units remains *"supplemental"* to domestic action in accordance with the Kyoto Protocol.[364]

However, no quantitative limit was agreed on the use of CERs during phase I.[365] For phase II, a requirement was introduced that Member States limit their use of CDM and JI emission units in the Kyoto period to a certain proportion of their emission units allocation, which is to be specified by each Member State in its NAP.[366] Hence, the limit varies among Member States and, in some cases, even among sectors within a Member State.[367] The reduction volume by offsets from abroad are estimated to be about one third of the total reduction requirement of the EU.[368] Whereas the limit of the use of CERs and ERUs in some countries is 10 per cent (UK, Italy, Germany), the limit raises up to 25 per cent in Poland and 50 per cent in Spain.[369] On top of the scale, however, are the Netherlands providing for 20 million offsets from abroad in its NAP for the period of 2008 to 2012. This amount, in fact, corresponds to the total reduction target of the Netherlands for this period.[370]

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364 Preamble, recital 7 of the Linking-Directive: *"Each Member State will decide on the limit for the use of CERs and ERUs from project activities having due regard to the relevant provisions of the Kyoto Protocol and the Marrakesh Accords, to meet the requirements therein that the use of the mechanisms should be supplemental to domestic action. Domestic action will thus constitute a significant element of the effort made."* In the Consolidated ETS-Directive, supplementarity is required by the preamble, recital 19: *"(...) In accordance with the relevant provisions of the Kyoto Protocol and Marrakech Accords, the use of the mechanisms should be supplemental to domestic action and domestic action will thus constitute a significant element of the effort made*."

365 Article 11a, paragraph 2 of the Linking-Directive.

366 Article 11a, paragraph 1 of the Linking-Directive.

367 ELLERMAN/JOSKOW, 4.

368 WINTER, 296.

369 CONVERY/REDMOND, 91.

370 GILBERTSON/REYES, 71, referring to THE NETHERLANDS MINISTRY FOR ECONOMIC AFFAIRS AND MINISTRY FOR HOUSING, Spatial Planning and the Environment (VROM), "*Netherlands national allocation plan for GHG emission units 2008-2012*", 10.

3.6.3.3 The Issue of Additionality

The use of CERs for compliance with reduction obligations under the EU-ETS reduces the need for domestic cuts in emissions.[371] A CER frees up an AAU leaving the Member State of the installation that bought a CER with one spare AAU. The AAU could be allocated to another installation, which could now emit one tonne of CO_2. As a result of the transaction, a reduction in emissions of CO_2 by one tonne by a CDM Project would have the effect of allowing the emission of two tonnes of CO_2 – one by the installation acquiring the CER and one by another entity within the Member State holding the spare AAU.

Unless CDM projects are truly additional, CERs in fact enlarge the over-all cap of the Annex B-world and undermine the environmental integrity of the CDM. (Figure 5) As a remedy, WINTER suggests that a transfer does not add to the national target, but that the State disposes of a reserve to serve an entity having invested in CDM.[372]

Additionality, however, is difficult to enforce in practice.[373] The estimation of emission reductions poses practical problems and to prove that emissions have been reduced beyond a business-as-usual scenario is challenging.[374] Even worse, the regulatory barrier to entering the CDM market works against the goal of additionality. For instance, transaction costs involved in developing new projects are so high that it only becomes practical to incur the extra costs if much of the work for the project would have been performed anyway.[375] Developers with meritorious projects might nevertheless abstain from CDM projects because of the regulatory barriers.[376]

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371 SANDBAG, 4.

372 WINTER, 296.

373 Practical examples are described by MICHAELOWA.

374 WEBER/DARBELLAY, 281/282.

375 WEBER/DARBELLAY, 282, referring to JOHN HUMPHREY, "*The Clean Development Mecanism: How to Increase Benefits for Developing Countries*", in: IDS Bulletin, Volume 35, Number 3, 2004, 84-89, 87.

376 WEBER/DARBELLAY, 282. The author of this thesis is involved in such a project and knows such considerations by own experience.

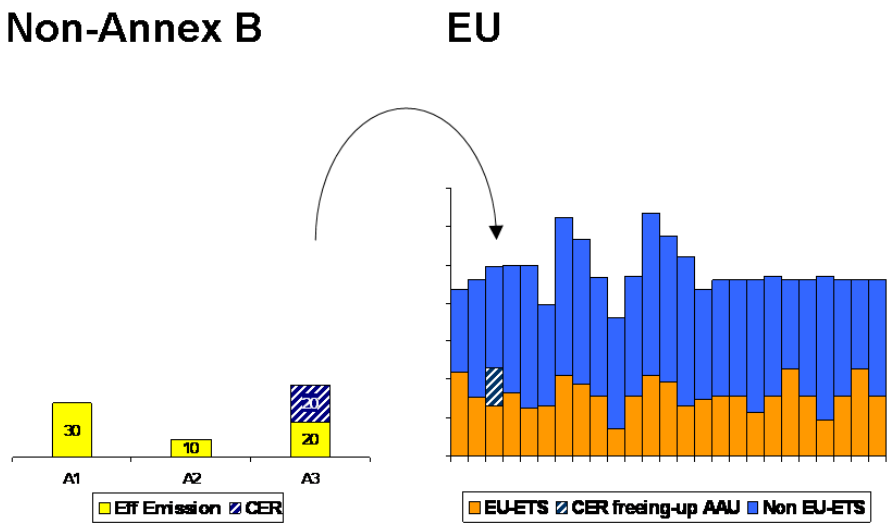

Figure 5: EU-ETS - Offsetting from Abroad
Each CER frees up an AAU enlarging the over-all cap of the Annex B-world.

3.6.3.4 Offsetting from Abroad - Outlook

The Consolidated ETS-Directive aims at reconciling the criticism and harmonizing the use of offsets from abroad by entities within the EU-ETS. The most momentous novelty is that new CERs will, as of 2013, only be issued for new projects in one of the world Least Developed Countries (LDC), whereas the use of *"conventional"* CERs is subject to certain restrictions.[377]

As long as there is no new international climate agreement, installation operators will be able to use either leftover CERs and ERUs from the period 2008 to 2012, or an amount corresponding to a certain percentage, which is to be set not below 11 per cent of their cumulated allocation during the period from 2008 to 2012, whichever is the highest.[378] New entrants will be able to use CERs/ERUs up to a certain percentage, which is to be set not below 4.5 per cent of their verified emissions during the period from 2013 to 2020. Aircraft operators shall be able to use offsets from abroad up to an amount corresponding to a percentage, *"which shall not be set below 1.5 per*

377 Article 11a, paragraph 4 of the Consolidated ETS-Directive. On the UN list of least developed countries, there are currently 33 countries in Africa, 14 in Asia and 1 in Latin America. List available at <http://www.unohrlls.org/en/ldc/related/62/>, accessed on 14 November 2011.

378 Article 11a, paragraph 8, first subparagraph of the Consolidated ETS-Directive.

cent of their verified emissions during the period from 2013 to 2020".[379] Measures will be adopted to determine the exact percentages.[380] These measures shall also ensure that the total allowed use of offsets does not exceed 50 per cent of the mandated reductions.[381]

Once an international agreement on climate change has been reached, only approved emission units from countries that have ratified the new international agreement will be accepted from 1 January 2013 onwards.[382] Commentators doubt whether the finally allowed amount of emission units from projects outside the EU to be used in the EU-ETS according to the Consolidated ETS-Directive, will be in accordance with the supplementarity principle as laid down in the Kyoto Protocol.[383]

As trading CERs has been driven mainly by the EU-ETS so far and the framework set by the EU-ETS directly influences the CDM market, political discussions in the EU on the treatment of CDM in the future have an effect on CER prices.[384] CDM project developers are thus faced with considerable uncertainty about future post-Kyoto agreement and the exhaustion of low-cost abatement options in developing countries raise concerns about the availability of such mechanisms.[385] Almost a decade of experience with CDM projects has certainly contributed to improve projects and procedures. Yet, without a renewed international agreement, the future of the mechanism is uncertain, the potential of CDM projects in LDC-countries appears to be low and investments into new CDM projects are unattractive.

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379 Article 11a, paragraph 8, third subparagraph of the Consolidated ETS-Directive.

380 Article 11a, paragraph 8, fifth subparagraph of the Consolidated ETS-Directive.

381 Article 11a, paragraph 8, subparagraph 4 of the Consolidated ETS-Directive. Based on data of the European Commission, the non-governmental organisation FERN estimates that, in the period between 2013 and 2020, a real reduction of emission of 3.9 per cent compared to emission of 2005 will be achieved, and that 60 per cent thereof will be achieved through compensation credits. FERN, *"Reducing Emissions or Playing with Numbers?"*, EU Forest Watch, March 2009, available at <http://www.fern.org/sites/fern.org/files/Playing%20with%20numbers.pdf>.

382 Article 11a, paragraph 7 of the Consolidated ETS-Directive and Article 28, paragraph 3 of the Consolidated ETS-Directive.

383 BAZELMANS, 308.

384 ZUMBACH, 47.

385 ANGER, 2047.

3.6.4 Linking with Aviation

With the inclusion of aviation into the EU-ETS, another unilateral offset-mechanism is introduced. The Aviation-Directive gives aircraft operators full access to the EU-ETS. Aircraft operators may buy EUAs without trading restriction.[386] Stationary installations covered by the EU-ETS, however, are not allowed to use aviation emission units for compliances purposes.[387]

Since emissions from international flight traffic are not covered by the Kyoto Protocol, the newly introduced European Union Aviation Allowances (EUAAs) do not correspond to an AAU.[388]

This poses a problem for the inclusion of aviation emissions into the EU-ETS, as transfers of aviation emission units from and into the EU-ETS could have a distorting effect on the Member States' assigned amounts.[389] The following example illustrates this point.

If an entity currently covered by the EU-ETS successfully reduces its emissions by one tonne of CO_2e, it can sell one EUA to an aircraft operator which would now acquire the right to emit one tonne of CO_2e. However, because aviation falls outside the scope of the Kyoto Protocol, an AAU cannot be transferred alongside the EUA, which would leave the Member State of the installation that sold the EUA with one spare AAU. The AAU could be allocated to a Non EU-ETS-entity, which could now emit one tonne of CO_2e. As a result of the transaction, a reduction in emissions of CO_2e by one tonne by the original installation would have the effect of allowing the emission of

386 Article 12, paragraph 2a of the Consolidated ETS-Directive: *"Administering Member States shall ensure that (...) each aircraft operator surrenders a number of allowances equal to the total emissions during the preceding calendar year from aviation activities (....)"*

387 Article 12, paragraph 3 of the Consolidated ETS-Directive: *"Member States shall ensure that, (...) the operator of each installation surrenders a number of allowances, other than allowances issued under Chapter II, equal to the total emissions from that installation during the preceding calendar year(....)"*. Chapter II of the Consolidated ETS-Directive contains the provisions concerning aviation.

388 By contrast, domestic aviation is included within the Kyoto targets. KAMINSKAITE-SALTERS, 333/4.

389 KAMINSKAITE-SALTERS, 331. Various options have been considered by the European Commission in this regard, namely the allocation of no emission units to the aviation sector, or imposing trading restrictions. For a discussion of the considered options, see KAMINSKAITE-SALTERS, 333/334.

two tonnes of CO_2e – one by the aircraft operator, and one by a Non EU-ETS entity within the Member State.[390]

The additional demand for EUAs by airlines may have as a consequence a reduced availability of EUAs for industry and energy companies.[391] The unrestricted access to EUAs for aircraft operators thereby enhances the risk of *"carbon leakage*" in the energy-intensive sectors.[392]

If energy-intensive sectors have to cope with an increased demand for EUAs, they may consider to relocate production to countries outside the EU. In addition, it remains unclear how the provision regarding the swapping of EUAAs for EUAs would work in practice. Would this require the Member States to provide aircraft operators with access to the AAUs which have not been earmarked for EUAs? Such a de-facto one-way linkage of the aviation sector to the Non EU-ETS will probably limit the environmental and economic benefits of emission trading seriously due to the effect of carbon leakage in the case of restricted access to emission units.[393]

3.7 Compliance Issues

The effectiveness of emission trading depends on compliance with the provisions of the ETS-Directive as amended.[394] The compliance regime comprises the various provisions that ensure participants hold emission units equal to their effected emissions during the relevant compliance period.[395]

Entities and installations covered by the EU-ETS have to comply with the allocated amount of EUAs. It is the Member State's duty to ensure that, by 30 April each year at the latest, the operator of each installation surrenders a number of emission units equal to the total emissions from that installation as verified.[396] Monitoring, reporting and verification (MRV) provide important input to the compliance system.[397]

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390 Example according to KAMINSKAITE-SALTERS, 332.
391 FIRST CLIMATE/ ECONABILITY, 79.
392 KAMINSKAITE-SALTERS, 334.
393 KAMINSKAITE-SALTERS, 335.
394 EPINEY, 242.
395 HAITES/MULLINS, 57.
396 Article 12, paragraph 3 of the Original ETS-Directive.
397 OBERTHÜR/LEFEBER, 152.

The respective provisions are remarkably precise. However, deficits in the implementation of control mechanisms are to be expected.[398] For example, control mechanisms are generally the responsibility of national bodies. The European Commission has limited instruments at its disposal.

3.7.1 Monitoring, Reporting and Verification (MRV)

The European Commission is conscious of the fact that, especially with regard to the future linkage with other Emission Trading Schemes, the role of MRV is essential for the reputation of the EU-ETS.[399]

In order to allow the market function properly, market players must have trust and confidence in the overall performance of an Emission Trading Scheme. According to the ETS-Directive, it is the Member State's responsibility to ensure an appropriate MRV-system according to regulations adopted by the Commission.[400] Access to information is guaranteed by Article 17 of the Original ETS-Directive. This principle is reinforced by Article 15a, introduced with Directive 2009/29/EC. Access to information covered by professional secrecy is restricted.[401]

Commission Decision 2004/156/EC established guidelines for the monitoring and reporting of GHG emissions during the pilot phase. In order to render the guidelines more clear and cost-efficient, the Commission replaced them with new guidelines. Commission Decision 2007/589/EC of 18 July 2007 (*"Monitoring Decision"*) sets out MRV-guidelines in its annexes. Annex I contains the *"General Guidelines"*.[402] Activity-specific guidelines are set up in subsequent annexes. The Monitoring Decision has been amended

398 EPINEY, 242/3, referring to MARTIN A. BECKMANN/ANDREAS FISAHN, "*Probleme des Handels mit Verschmutzungsrechten – eine Bewertung ordnungsrechtlicher und marktgesteuerter Instrumente in der Umweltpolitik*;" in: Zeitschrift für Umweltrecht (ZUR), Volume 6, 2009, 29-303.

399 EUROPEAN COMMISSION, "*Impact Assessment*", 62.

400 Article 14 of the Consolidated ETS-Directive with regard to monitoring and reporting, Article 15 of the Consolidated ETS-Directive with regard to verification.

401 Article 15a, paragraph 2 of the Consolidated ETS-Directive.

402 The *"general guidelines"* of Annex I to Decision 2007/589/EC are thereafter referred to as *"Monitoring Guidelines"*.

by three Decisions on nitrous oxide,[403] aviation activities[404] and capture, transport and geological storage of carbon dioxide.[405]

The new Monitoring Guidelines are applied as of 1 January 2008.[406] They attempt to define the appropriate balance between cost-effectiveness and accuracy.[407] A special concern is to facilitate the application of the guidelines for installations with average verified reported emissions of less than 25'000 tonnes of fossil CO_2 per year during the pilot phase.[408]

The Monitoring Guidelines stress fundamental principles such as completeness, consistency, transparency, faithfulness and trueness. Due diligence shall be exercised to ensure that the calculation and measurement of emissions exhibit *"highest achievable accuracy"*. The operator shall enable reasonable assurance of the *"integrity of reported emissions"*.[409]

Section 4.2. of the Monitoring Guidelines describes two methodologies[410] for the determination of effected GHG emissions: The operator may propose either (1) a calculation-based methodology, determining emissions from source streams based on activity data or (2) a measurement-based methodology, determining emissions from an emission source by means of continuous measurement of the concentration of the relevant GHG. The use of a measurement-based methodology shall be subject of the approval of the compe-

403 Commission Decision 2009/73/EC of 17 December 2008 amending Decision 2007/589/EC as regards the inclusion of monitoring and reporting guidelines for emissions of nitrous oxide, available at <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:024:0018:0029:EN:PDF>.

404 Commission Decision 2009/339/EC of 16 April 2009 amending Decision 2007/589/EC as regards the inclusion of monitoring and reporting guidelines for emissions and tonne-kilometre data from aviation activities, available at <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:103:0010:0029:EN:PDF>.

405 Commission Decision 2010/345/EC of 8 June 2010 amending Decision 2007/589/EC as regards the inclusion of monitoring and reporting guidelines for emissions from the capture, transport and geological storage of carbon dioxide, available at <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:155:0034:0047:EN:PDF >.

406 Article 3 of the Monitoring Decision.

407 Preamble, recital 10 of the Monitoring Decision.

408 Preamble, recital 4 of the Monitoring Decision.

409 Annex I of the Monitoring Guidelines, Section 3, *"Monitoring and Reporting Principles"*.

410 According to Section 2 *„Definitions"* of the Monitoring Guidelines, *"monitoring methodology"* means the sum of approaches used by an operator to determine the emissions of a given installation.

tent authority. For each reporting period,[411] the operator shall corroborate the measured emissions by means of a calculation-based methodology in accordance with the provisions regarding *"Corroborating calculation of emissions"* of the Monitoring Guidelines.[412] The operator has to submit the verified report for emissions during the preceding year to the competent authority by 31 March each year for emissions during the preceding year.[413]

Before the start of the reporting period, the operator has to establish a monitoring plan which shall be approved by the competent authority and again after any substantial changes to the monitoring methodology have been introduced.[414] The monitoring plan[415] shall, among others, contain a description of the calculation-based methodology or measurement-based methodology to be used and a description of the measurement system.[416]

Section 14 of the Monitoring Guidelines contains a standard reporting format. The information required in this format shall be used as a basis for reporting of the quantitative data.[417] The operator has to establish, document, implement and maintain an effective control system to ensure that the annual emissions report does not contain misstatements and is in conformance with the approved monitoring plan, the permit and these guidelines. The operator is also responsible for a quality assurance which ensures that relevant measuring equipment is calibrated, adjusted and checked at regular intervals including prior to use, and checked against measurement standard traceable to international measurement standards.[418]

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411 According to Section 2 *„Definitions"* of the Monitoring Guidelines, *"reporting period"* means one calendar year during which emissions have to be monitored and reported, whereas a *"trading period"* means a multiple year phase of the emission trading scheme (e.g. 2005-2007 or 2008-2012) for which a national allocation plan is issued by the Member State.

412 Section 4.2. of the Monitoring Guidelines.

413 Section 8 on *"Reporting"* of the Monitoring Guidelines.

414 Article 6, paragraph 2, subparagraph c) of the Consolidated ETS-Directive.

415 According to Section 2 *"Definitions"* of the Monitoring Guidelines, *"monitoring plan"* means a detailed, complete and transparent documentation of the monitoring methodology of a specific installation, including documentation of the data acquisition and data handling activities, and the system to control the trueness thereof.

416 For a detailed description see Section 4.3. of the Monitoring Guidelines.

417 The reporting format according to Section 14 of the Monitoring Guidelines has to be used unless an equivalent electronic standard protocol for annual reporting has been published by the EU Commissions. See Section 8 on *"Reporting"* of the Monitoring Guidelines.

418 Section 10.3.2. of the Monitoring Guidelines.

The emission reporting is then subject to an external verification. Member States are responsible to ensure that the reports submitted by operators and aircraft operators are verified in accordance with the criteria set out in Annex V of the Consolidated ETS-Directive.[419] The objective of the verification is to ensure that emissions have been monitored in accordance with the guidelines and that reliable and correct emissions data will be reported. In authorizing external verifiers, Member States shall consider respective guidance issued by the European Cooperation for Accreditation (EA).[420]

Member States shall ensure that, by 30 April of each year, the operator of the installation surrenders a number of duly verified emission units equal to the total emissions from that installation or aircraft operator and that these are subsequently cancelled.[421]

The ETS-Directive and the Monitoring Guidelines only regulate some fundamental requirements and aspects of the verification process. Details are left to Member States. Most, but not all Member States developed specific national verification guidance often based on internationally acknowledged criteria. Quality checks of verification reports are also carried out in many Member States, but not in all.[422] These differences in practice are not deemed to comply with the requirements of the internal market and might incur higher costs than necessary, if qualified verifiers are not able to do their job across the internal market.[423]

Therefore, with Directive 2009/29/EC, the Commission aimed at ensuring a common approach, higher consistency, transparency, improved cost effectiveness of monitoring and reporting standards.[424]

By 31 December 2011, the Commission shall adopt a regulation for the monitoring and reporting of emissions which shall be based on the principles for monitoring and reporting set out in Annex IV of the Consolidated ETS-

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419 Article 15 of the Consolidated ETS-Directive.

420 Section 10.4.1. of the Monitoring Guidelines. There are currently no harmonised criteria for accreditation of verifiers and accreditation requirements differ between Member States.

421 Article 12, paragraph 2a of the Consolidated ETS-Directive with regard to aircraft operators and paragraph 3 with regard to stationary installations.

422 See EUROPEAN ENVIRONMENT AGENCY, "*Application of the Emission Trading Directive by EU Member States – reporting year 2008*", Technical report No. 13/2008, 54/55, available at <http://www.eea.europa.eu/publications/technical_report_2008_13>.

423 EUROPEAN COMMISSION, "*Impact Assessment*", 71.

424 EUROPEAN COMMISSION, "*Impact Assessment*", 63.

Directive, taking into account the most accurate and up-to-date scientific evidence available, in particular from the IPCC.[425] Moreover, it may also specify requirements for operators to report on emissions associated with the production of *"goods produced by energy intensive industries which may be subject to international competition"*.[426]

Also by 31 December 2011, the Commission shall adopt a regulation for the verification of emission reports based on the principles set out in Annex V of the Consolidated ETS-Directive regarding the accreditation and supervision of verifiers.[427]

3.7.2 Registration in the EU-ETS

In all the existing carbon markets, emission units exist exclusively uncharted and in electronic form. Therefore, the ETS-Directive asks Member States to provide for the establishment and maintenance of an electronic registry in order to be able to record every transaction.[428]

Commission Regulation 994/2008/EC of 8 October 2008 provides the details for an integrated Community system of registries, consisting of the registries of the Community and its Member States.[429]

In phase I of the EU-ETS, the 25 Member State registries were supposed to be connected by means of the Community Independent Transaction Log (CITL). But when the trial period started on 1 January 2005, there was only one operating national registry.[430]

In phase II, with the start of the first commitment period under the Kyoto Protocol, Member State registries function at the same time as registries for the purposes of the Kyoto Protocol and are, therefore, connected by and to

425 Article 14, paragraphs 1 and 2 of the Consolidated ETS-Directive.

426 Article 14, paragraph 2 of the Consolidated ETS-Directive.

427 Article 15, of the Consolidated ETS-Directive.

428 Article 19 of the Original and Consolidated ETS-Directive.

429 Commission Regulation 994/2008/EC of 8 October 2008 for a standardised and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision No 280/2004/EC of the European Parliament and of the Council, OJ L 271/3, 11.10.2008, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:271:0003:0003:EN:PDF>. Commission Regulation 994/2008/EC replaces Commission Regulation 2216/2004/EC of 21 December 2004.

430 ELLERMAN/JOSKOW, 9.

the International Transaction Log (ITL) managed by the UNFCCC for the purposes of the Kyoto Protocol. Consequently, every single transfer of emission units (within a registry or between two registries) needs to pass through the ITL.

Although the technical standard for the co-operation between registry, ITL and CITL is well developed, the ITL's entry into the EU-ETS introduces technical, political and administrative risks.[431] The technical risks are due to the fact that messages will have to pass through more systems, which increases the scope for errors and misuse. Indeed, on 19 January 2011, the European Commission suspended transactions, except for allocation and surrender of allowances, in all EU-ETS registries in response to an unauthorised access to EU-ETS-registry accounts in Romania *("cyber theft")*. A similar incident happened earlier in Germany. Therefore, the European Commission asked the national registries for a report on the adequacy of their security measures. Normal operation could be resumed only after review and approval of the national reports by the Commission.[432]

For phase III, the Consolidated ETS-Directive foresees to merge registries into a single EU-wide registry. Emission units issued from 1 January 2012 onwards shall be held in the Community registry.[433] The new registry will be operated by the Commission and will replace all EU-ETS registries currently hosted in the Member States. All transactions taking place in the registry will be subject to the approval of the European Union Transaction Log (EUTL), the successor of the CITL.[434] Nonetheless, each Member State shall continue to be able to fulfil the execution of authorized operations under the UNFCCC of the Kyoto Protocol.[435] The Commission shall adopt a Regulation for a standardised and secured system of registries in the form of standardised electronic databases containing common data elements to track the issue, holding, transfer and cancellation of allowances.[436]

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431 EUROPEAN COMMISSION, "*Impact Assessment*", 87.

432 As of 26 July 2011, most of the registries are *"partially operational"*. For actual status of the registries check at <http://ec.europa.eu/environment/ets/registrySearch.do;jsessionid=vcPsTnSLdGND6Sg52zZ72Kp4yV9pL8bC12kQ6QTrpSNhGFXhQmpJ!7151055>.

433 Article 19, paragraph 1 of the Consolidated ETS-Directive.

434 See latest update of 18 July 2011, available at <http://ec.europa.eu/environment/ets/>.

435 Article 19, paragraph 1 of the Consolidated ETS-Directive.

436 Article 19, paragraph 3 of the Consolidated ETS-Directive That Regulation shall also include provisions concerning the use and identification of CERs and ERUs in the Community scheme and the monitroing of the level of such use. In addition, Article 19,

Compliance is recorded in accounts associated with each emitting installation are maintained in registries.[437] These registries record the initial allocations to installation accounts, all transfers in and out of accounts and the annual surrender of allowances for compliance. Neither the prices of these transfers nor the value of a transaction nor the date of transfer is reported in the CITL.[438] The registry of origin for every surrendered allowance is reported, however, the identity of the installation to which the allowance was initially issued is not reported.[439]

The Registry Regulation provides for the nomination of an *"additional authorized representative"*.[440] For any transaction with EUAs or Kyoto emission units, the agreement of the additional authorized representative is required in addition to the agreement of an authorized representative. This provision allows EU Member States to permit a holder of an EUA to use it as a security.[441]

Because EUAs are not fully exchangeable with all Kyoto emission units, the original identity of the converted AAUs has to be tagged and traced in the registry. Only because the origin of each EUA is traced, the EU-ETS may use a different definition of what is allowed to be traded within the scheme.[442]

3.7.3 Temporal Flexibility

The forward transfer of emission reductions in time is referred to as *"banking"*, which means that an over-fulfilment of the target in the current commitment period can be carried over to subsequent commitment periods. The opposite is referred to as *"borrowing"*: Emission units from a subsequent

paragraph 4 of the Consolidated ETS-Directive asks for appropriate modalities for the Community registry to undertake transaction and other operations in case of non-binding arrangements with third countries or with sub-federal or regional entities according to Article 25, paragraph 1b of the Consolidated ETS-Directive.

437 See Section 1 *„Accounts"* of Commission Regulation 994/2008 of 8 October 2008. According to Article 19, paragraph 2 of the Original and Consolidated ETS-Directive, any person may hold emission units.

438 TROTIGNON/ELLERMAN, 15.

439 TROTIGNON/ELLERMAN, 4. The CITL data on the installation origin of surrendered emission units is made publicly available five years after the surrender date.

440 Article 19, paragraph 2 of Commission Regualtion 994/2008/EC.

441 POHLMANN, 352.

442 BAZELMANS, 300.

allocation year are placed in installation holding accounts for compliance purposes.

3.7.3.1 Banking

As a general principle, EUAs are valid for one trading period.[443] For each phase, the EU sets a multi-year cap with no limit on banking within that phase.[444] Due to the experience in phase I, banking of EUAs from phase II to phase III was introduced. Through the conversion which is mandatory according to Article 13, paragraph 2 of the Consolidated ETS-Directive, entities build up emission unit reserves. With this mechanism, the Commission intends to avoid that entities are deprived of their property if over-allocated and unused emission units lose their validity at the end of a commitment period.[445] Four months after the beginning of each period, emission units which are no longer valid and have not been surrendered and cancelled shall be cancelled by the competent authority to be replaced with emission units valid for the current period.[446]

As for offsets from abroad, Article 11a introduced by Directive 2009/29/EC explicitly allows banking of CERs /ERUs into phase III. Before the entry into force of an international agreement on climate change, operators may request to receive emission units valid from 2013 onward in exchange for unused CERs and ERUs issued for emission reductions up until 2012 from project types which were eligible for use in the Community scheme during the period from 2008 to 2012.[447] The competent authority shall make such an exchange on request until 31 March 2015.

However, once an international agreement on climate change has been reached, only credits[448] from projects from third countries which have ratified that agreement shall be accepted in the Community scheme from 1

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443 Article 13, paragraph 1 of the Original ETS-Directive.

444 ELLERMAN/JOSKOW, 3.

445 EPINEY, 237.

446 Article 13, paragraph 2 of the Consolidated ETS-Directive.

447 Article 11a, paragraph 2 of the Consolidated ETS-Directive. Since CDM enjoyed a *"prompt start"* authorized by Article 12 of the Kyoto Protocol, all unused CERs obtained as of 2001 can be used to assist in achieving compliance in phase III.

448 The term *"credits"* is used instead of CERs or ERUs, because a continuation of the project-based mechanism of Article 6 and Article 12 of the Kyoto Protocol cannot be taken for granted.

January 2013.[449] With regard to new projects started from 2013 onwards, only CERs from LDC may be exchanged for emission units.[450]

Banking allows installations and operators covered by the EU-ETS to save unused emission units for use in future years.[451] By allowing EUAs and CERs to be banked, the banking provisions helped to prevent the potential over-allocation in phase II. This over-allocation led to a complete price collapse of the EUA towards the end of phase I.[452]

Bankability of emission units means that nearly 40 per cent of phase III effort could be met by carry-over from phase II, without companies having to invest in reducing domestic emissions. The EU-ETS will not require domestic emissions reductions for the next seven years.[453] Consequently, banking may also be viewed as a *"decelerator"* that leads to fewer emissions reductions in later program years.[454]

Another effect of banking is the bypassing of restrictive eligibility for offsets in phase III. By swapping of CDM/JI credits for EUAs in phase II, they can be banked and used for offsetting in the phase III.[455]

3.7.3.2 Borrowing

Borrowing is the possibility to use *("borrow")* emission units from future periods for which allocations have not yet been fixed to demonstrate compliance in an earlier year.[456]

Borrowing can be made from the next year's allocation since each year's endowment of emission units is placed in installation holding accounts at the end of February in each year, two months before the surrender of emission units for the past year's emissions is required.[457]

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449 Article 11a, paragraph 7 of the Consolidated ETS-Directive. Article 28 of the Consolidated ETS-Directive provides for adjustments applicable upon the approval by the Community of an international agreement on climate change. Within three months of the signature, the Commission shall submit a report and a legislative proposal.

450 Article 11a, paragraph 4 of the Consolidated ETS-Directive.

451 JAFFE/RANSON/STAVINS, 792.

452 DE SÉPIBUS, Linking, 2008, 19.

453 SANDBAG, 14.

454 MCALLISTER, 424.

455 DE SÉPIBUS, Linking, 2008, 21.

456 JAFFE/RANSON/STAVINS, 792.

457 TROTIGNON/ELLERMAN, 17.

Hence, at the time of determining compliance, they dispose of two annual sets of EUAs to cover their emissions except for the final year of each trading period when only one set is available. This feature will be progressively phased out as the EU shifts to 100 per cent auctioning and, hence, fewer emission units will be allocated at the start of the year. As of 2012, the EU-ETS will include the possibility of moving forward the auctioning of emission units from future years if prices rise high. This possibility constitutes an example of "*intra-trading period borrowing"*.[458]

The analysis of compliance trading in phase I by TROTIGNON/ELLERMAN shows that an unique feature of the EU-ETS, the ability to borrow against the next year's allocation, was used by many participants.[459] The sharply increasing rate of trading for compliance purposes in each of the years of the first trading period indicates it. This behaviour is also strongly suggested by examination of installation level data where a significant number of installations appear to have borrowed for compliance in 2005 and 2006 and paid the borrowing back in 2007 with large imports of non-domestic EUAs.[460]

Borrowing is not seen favourably from an environmental perspective. Firstly, borrowing entails the risk that mitigation measures may not be taken in future periods either, for example due to lack of enforcement or if a company goes bankrupt. Secondly, companies may have an incentive to rely heavily on borrowing to artificially raise their futures compliance cost curve and then argue that they need softer targets because otherwise the costs would be prohibitive.[461]

A study which analyzed the CITL data on cross-border trades, borrowing and banking during the concluded first trading period of the EU-ETS identified a surprisingly active cross-border trading within the EU-ETS. It was many times greater than what would have been needed to assure compliance for the installations in the four Member States that were in a net short position.[462]

458 STERK/MEHLING/TUERK, 17.
459 TROTIGNON/ELLERMAN, 27.
460 TROTIGNON/ELLERMAN, 27.
461 STERK/MEHLING/TUERK, 18.
462 TROTIGNON/ELLERMAN, 27.

This finding shows that compliance trading is not the only, or even the main, reason for participation in emission units markets. Most trades seem to be motivated by financial considerations such as hedging forward positions.[463]

3.7.4 Non-Compliance with Reduction Target

For every reported and verified tCO_2e an installation under the EU-ETS emitted, the operator of the installation has to surrender one EUA. A shortage of EUA can be compensated by purchasing emission units from other entities within the EU-ETS or by purchasing CERs or ERUs from abroad.

For failure to surrender sufficient allowances by 30 April each year, a fine of 40 EUR was applied for each metric tonne of CO_2 emitted during the pilot phase. During phase II, the fine amounts to 100 EUR. Starting in 2013, this amount will be annually adjusted for inflation.[464] Those fined must also make up the deficit by buying the relevant volume of EUAs.[465] Additional civil and criminal penalties, for example for fraudulent reporting, are left to Member States, under the condition that relevant legal provisions are notified to the European Commission and that they are effective, proportionate, and dissuasive. Finally, the obligation to publish the names of the offending entities adds a *"name and shame"* element to the compliance regime.[466]

The ETS-Directive is the only EU law to prescribe financial penalties that must be applied automatically for non-compliance.[467] At the same time, it is the only consistent penalty in the Directive. For any other non-compliance events (e.g. failing to monitor in accordance with the monitoring plan), each Member State would implement different requirements as provided for in national legislation and policies.[468]

Penalties shall be laid down by Member States and must be *"effective, proportionate and dissuasive."*[469] Penalties that make the act of non-compliance unattractive are essential to ensure the effective operation of an Emission Trading Scheme. Only if penalty payments are sufficiently high, covered

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463 TROTIGNON/ELLERMAN, 3.

464 Article 16, paragraphs 3 and 4 of the Consolidated ETS-Directive.

465 CONVERY/REDMOND, 94.

466 Article 16, paragraph 2 of the Original and Consolidated ETS-Directive. See also STERK/MEHLING/TUERK, 19.

467 ELLERMAN/JOSKOW, 6.

468 EUROPEAN COMMISSION, "*Impact Assessment*", 83.

469 Article 16, paragraph 1 of the Original and Consolidated ETS-Directive..

entities will either reduce emissions or buy additional emission units on the trading market.[470]

Aircraft operators are subject to the same non-compliance penalties as they are applicable to all other operators under the EU-ETS.[471]

3.7.5 Enforcement

The Member States are responsible for enforcing compliance.[472] Member States have considerable flexibility to determine the types of offences that penalties are applied for. Therefore, objectives of the amendments to the ETS-Directive were (1) to reinforce compliance by ensuring that all operators in the same system are subject to similar compliance checks and penalties/enforcement actions and (2) to ensure compliance also in the longer term.[473]

Enforcement provisions on Community level exist only with regard to aircraft operators. In the case of insufficient coverage with emission units, the administering Member State shall, as a first step, publish the name of the non-compliant aircraft operator in addition to the fine of 100 EUR per tCO_2e in excess.[474] In the event of an aircraft operator failing to comply with the requirements of the ETS-Directive and where other enforcement measures have failed to ensure compliance, its administering Member State may request the Commission to decide on the imposition of an operating ban on the aircraft operator concerned.[475] An operating ban may not only be imposed in case of non-compliance with invalidated emission units, but also in case of any other breach against the provisions of the ETS-Directive.[476] Each Member State shall enforce any decision within its territory.[477]

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470 MACE ET AL, 66.
471 Article 16 of the Consolidated ETS-Directive. See also POHLMANN, 346.
472 ELLERMAN/JOSKOW, 10.
473 EUROPEAN COMMISSION, "*Impact Assessment*", 83.
474 BARTLIK, 205.
475 Article 15, paragraph 5 of the Consolidated ETS-Directive.
476 BARTLIK, 205.
477 Article 16, paragraph 11 of the Consolidated ETS-Directive.

3.8 Performance of the EU-ETS

Emission trading was initiated as an instrument for environmental protection. Emission trading was also initiated as an instrument to reduce the costs to meet a given emission target. There are, consequently, two indicators available for assessing the performance of an Emission Trading Scheme: price and effected emission reductions.

3.8.1 Carbon Price

The price of emission units is a relatively clear and transparent indicator to assess the performance of an Emission Trading Scheme.[478] In phase I of the EU-ETS, prices were expected to be around 8 EUR to 12 EUR. However, prices increased to over 30 EUR in mid-2005. In April 2006, the news that most EU Member States produced fewer tonnes of emissions than allocated caused a collapse of the carbon price.[479] Prices declined to 15 EUR and, by February 2007, prices fell to less than 1 EUR where they remained until the end of phase I.[480]

In phase II, prices started at around 15 EUR and increased to almost 30 EUR due to extraordinarily high energy prices up to mid-2008. Since 2008, economic recession has led to fewer emissions and the voluminous supply of offsets from the CDM has led to this year's prices of about 10 EUR to 15 EUR.[481]

However, conclusions on the basis of the development of the carbon price only have to be drawn with caution. This development alone does not necessarily provide hard proof that the Emission Trading Scheme was either effective or ineffective in reaching particular policy goals. The reason is that it remains often difficult to show that particular effects are necessarily the di-

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478 For a historical overview over the price development for EUAs see POINTCARBONNEWS, Volume 09, Number 28, 16 July 2010, available at <http://www.firstclimate.com/uploads/media/CarbonMarketEurope.pdf>. For a comprehensive chart of the historical price development from 2005 to mid-2009 see GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 10, based on data from Point Carbon. See also WRÅKE, 7.

479 ELLERMAN/JOSKOW, 12-15; GRUBB, 1.

480 MCALLISTER, 415, citing ELLERMAN/JOSKOW, 13, noting that although the price of phase I emission units collapsed, the trading of phase II emission units since 2005 has established a market price of about 20 USD. See also ELLERMAN/JOSKOW.

481 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12.

rect consequence of a policy instrument chosen, in this particular case emission trading.[482]

Summing up, the performance of the EU-ETS is positive in so far as a carbon price is successfully established. The volatility of the price, however, was extreme.[483] Instruments to reduce volatility would be helpful. By more generous banking provisions, first measures against volatility have been taken.

3.8.2 Effected Emission Reductions

The performance of an Emission Trading Scheme may also be assessed by quantifying the effected emission reductions. A quantification of emission reductions, however, is marked by uncertainty and intransparency. It involves the construction of a counterfactual estimate of what emissions would have been in the absence of the EU-ETS. This counterfactual estimate should take into account actual economic growth, energy prices, and whether all of these variables affect what emissions would have been without a CO_2 price.[484]

ELLERMAN/BUCHNER were the first ones to quantify the aggregate emission reductions with a careful quantification and discussion of the different possible counterfactuals.[485] Their studies suggest that the EU-ETS in its first two years cut emissions by 50-100 million tCO_2 per year, or by around 2.5-5 per cent.[486] Whether this estimation is adequate or not cannot be proved. MCALLISTER, for example, estimates that emissions by covered sources increased during phase I by about 2 per cent, contrary to the goal of reducing emissions for compliance with the Kyoto Protocol.[487]

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482 FAURE/PEETERS (eds), 6/7.

483 See WEBER/DARBELLAY, 275, explaining the extreme volatility with the fact that the carbon market is very young. Time and more certainty about its futures prospect should, according to WEBER/DARBELLAY, lend it the credibility needed to achieve a certain degree of market stabilization.

484 ELLERMAN/JOSKOW, 34.

485 CONVERY, 125.

486 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 11, referring to DENNY ELLERMAN/BARBARA BUCHNER, *"Over-Allocation Or Abatement? A Preliminary Analysis of the EU ETS Based on the 2005-2006 Emissions Data",* in: Environmental and Resource Economics, Volume 41, Number 2, 2008.

487 MCALLISTER, 409/410.

According to information of the EU-Commission, emissions of 2008 were 3.06 per cent lower than the 2007 level.[488] In a presentation of 14 July 2011, CONNIE HEDEGAARD, present European Commissioner for Climate Action, pointed out that *"average annual emissions per installation in 2010 were around 8 per cent lower than when the ETS was launched in 2005"*.[489]

Notwithstanding the optimistic comments by the EU-Commission, the performance of the EU-ETS in terms of effected emission reductions is considered to be unsatisfying.[490] The main cause is the different approaches to allocation adopted by the Member States in phase I and phase II of the EU-ETS and the resulting lenient over-all cap of the EU-ETS.[491]

3.9 Outlook on the Future of the EU-ETS

A functioning market for emission units has been developed within the EU-ETS. Although there have been plenty of rough edges in the early years, a cap-and-trade infrastructure is in place including registries, monitoring, reporting and verification institutions. A significant segment of European industry is incorporating the price of CO_2 emissions into their daily production decisions.[492] These early insights into the functioning of carbon markets are valuable and must be considered as a success.

Yet, the EU-ETS is not pulling its weight.[493] Even if sources comply with the cap, no program will achieve its environmental goals if caps are not stringent enough.[494] Until the situation of surplus emission units in the EU-ETS is resolved, the pressure on energy-intensive companies to reduce emissions will remain low, as will carbon prices.[495]

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488 EU COMMISSION, "*Emissions trading: EU-ETS emissions falls 3 per cent in 2008"*, Press Release 18 May 2009, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/794&format=HTML&aged=0&language=EN&guiLanguage=en>.

489 CONNIE HEDEGAARD, "*The ETS is delivering real emission reductions"*, Speech at the European Parliament of 14 July 2011, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/11/527>.

490 SANDBAG, 11.

491 KAMINSKAITE-SALTERS, 326.

492 ELLERMAN/JOSKOW, iii.

493 SANDBAG, 11.

494 MCALLISTER, 396/397.

495 SANDBAG, 11.

With the harmonized allocation rules of Directive 29/2009/EC, the first step into the right direction is taken. Still, the problem of too many emission units remains.[496] And new challenges are ahead.

The first challenge is the inclusion of aviation expanding the volume of the EU-ETS by about 10 per cent. How will the swapping of EUAAs for EUAs work in practice? Will the unrestricted access to EUAs cause carbon leakage in the energy-intensive sectors?[497]

The second challenge is to address the issue of the Non EU-ETS sectors. How can additional sectors be included into the EU-ETS?[498] Will further climate-energy measures of the Commission to achieve reductions in the Non EU-ETS sectors be effective?[499]

It is not the intention of the European Union to focus on emission trading as an only measure to achieve emission reductions.[500] The Emission Trading Scheme of the European Union must be looked at as one of many pieces within the entire mosaic of the European Union's climate change policy. Consequently, Member States are encouraged to take complementary action

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496 SANDBAG, 17. SANDBAG, a not-for-profit campaigning organisation based in the United Kingdom which is favourable towards emission trading as a concept, proposes to tackle the surplus of emission units available by granting tax incentives against cancelled emission units. An alternative would be to allow companies to use the emission units as alternatives to offsets for their emissions generated in sectors such as transport which are not currently covered by the ETS. The latter proposal would signify a de-facto inclusion of Non EU-ETS sectors into the EU-ETS.

497 KAMINSKAITE-SALTERS, 335.

498 See, for example, FLACHSLAND/BRUNNER/EDENHOFER/CREUTZIG, in: Flachsland, Dissertation, 2010, 99-142. The authors analyze design options and economic impacts of including the European road transport sector into the EU-ETS.

499 EPINEY, 239, contesting the effectiveness of the measures introduced with Decision 406/2009/EC of 23 April 2009.

500 When presenting the European Climate Change Programme in 2000, the former EU Environment Commissioner MARGOT WALLSTRÖM stated that "(…)*the key to meeting our Kyoto commitments is not to concentrate on one or the other sector, or one or the other instrument, but to take action simultaneously on a broad range of emission sources. (...) Together with other polices and measures, emissions trading will be an integral part of this Programme and the Community's implementation strategy"*. Press Release of 8 March 2000 the European Commission available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/00/232&format=HTML&aged=0&language=EN&guiLanguage=en>.

and to consider the introduction and the implications of additional regulatory, fiscal or other policies.[501]

[501] Preamble, recital 23 of the Original and Consolidated ETS-Directive: "*Emission allowance trading should form part of a comprehensive and coherent package of policies and measures implemented at Member State and Community level. (…) Member States may consider the implications of regulatory, fiscal or other policies that pursue the same objectives.*"

4 The Emission Trading Scheme of Switzerland

4.1 Introduction

For the Kyoto commitment period from 2008 to 2012, Switzerland has implemented a combined system of *"Voluntary Measures"* and a *"Steering Fee"* on fossil fuel in order to reach the emission reduction targets. As of 2013, the Federal Council strives for a linkage of the Emission Trading Scheme in Switzerland with the EU-ETS because of *"increased advantages of emission trading in a larger trading scheme"*.[502]

Some commentators call the Swiss system in place *"Emission Trading Scheme"* (CH-ETS) or *"cap-and-trade"* system.[503] Others avoid these terms when describing the current CO_2-regime in Switzerland.[504] In their view, an enlargement of the market would not be a *"linkage"* of the EU-ETS to the CH-ETS, but an *"access for Swiss companies"* to the EU-ETS.[505]

4.2 Current Legislation in Switzerland

With parliamentary resolution *("Bundesbeschluss")* of 2 June 2003, the Federal Council was empowered to ratify the Kyoto Protocol to the UNFCCC by the Swiss Parliament. Switzerland thereby took on the commitment to reduce GHG emissions between 2008 and 2012 by 8 per cent versus the 1990 levels and receives the corresponding amount of *"Assigned Amount Units"* (AAU).[506]

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502 BURKHARDT, 76.

503 For example HAUSER, 818; BURKHARDT, 75, 80; KECKEIS, 829.

504 For example BALLY, 849, distinguishing between *"market-economy-oriented measures"* (such as CO_2-Fee, emission credits and emission certificates) and *"command-and-control measures"* (such as emission requirements for vehicles and the obligation to compensate).

505 BALLY, 854. This thesis uses the term "*CH-ETS*".

506 The calculated assigned amount for the five years period is 242'838'402 tCO_2e. See Switzerland's Initial Report – Update following the UNFCCC Review, 2007, available at

The assigned amount per year for Switzerland is split up into emission units some of which are passed on to companies with reduction targets under the CO_2-Act.[507] If its emissions remain below this level, Switzerland can sell its excess emission units on the Kyoto carbon market.

4.2.1 CO_2-Act of 8 October 1999

In its so-called "*Sustainability-Article*", the Constitution of Switzerland calls for a balanced and sustainable relationship between nature and the demands of the population.[508] Article 74 of the Constitution requires the federal legislation to protect the population and its natural environment according to the polluter-pays principle.[509] The Environmental Protection Act ("*Umweltschutzgesetz*") stipulates that pollution must be restricted at the source of its origin.[510]

On this legal basis, the CO_2-Act of 8 October 1999 was introduced. It regulates the transfer of the assigned amount of emission units to Swiss companies and entered into effect on 1 May 2000.[511]

The CO_2-Act forms the central pillar of Swiss climate policy. Its first objective is to reduce the emissions of climate-relevant CO_2 arising from the combustion of fossil fuels by 10 per cent by 2010 versus the 1990 level. Its sec-

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<http://unfccc.int/files/national_reports/initial_reports_under_the_kyoto_protocol/application/pdf/initial_report_-_update_following_review.pdf>.

507 FOEN, Emission Credits, Offsetting and Trading, 1-3.

508 Article 73 of the Constitution of Switzerland: *"The Confederation and the Cantons shall endeavour to achieve a balanced and sustainable relationship between nature and its capacity to renew itself and the demands placed on it by the population."* Cited according to an unofficial English translation, available at <http://www.admin.ch/ch/e/rs/101/index.html#id-3-ni8-4>.

509 Article 74, paragraph 1 of the Constitution of Switzerland: "*The Confederation shall legislate on the protection of the population and its natural environment against damage or nuisance."* Article 74, paragraph 2 of the Constitution of Switzerland: "*It shall ensure that such damage or nuisance is avoided. The costs of avoiding or eliminating such damage or nuisance shall be borne by those responsible for causing it*." Cited according to an unofficial English translation, available at <http://www.admin.ch/ch/e/rs/101/index.html#id-3-ni8-4>.

510 Article 11, paragraph 1 of the Environmental Protection Act ("*Umweltschutzgesetz*").

511 SR 641.71; AS 2000 979. Various amendments have been made. The most important ones are the obligation to use a part of the CO_2-Fee for energy efficency programs in the building sector as of 1 January 2010 and the amendment regarding fossil fired power plants as of 1 January 2011. See HAUSER, 814.

ond objective is compliance with the national Article 3.1-commitment of the Kyoto Protocol to reduce GHG emissions between 2008 and 2012 by 8 per cent versus the 1990 level.

The CO_2-Act defines the yearly average of the years 2008 to 2012 as decisive for the determination of compliance with the first objective of a 10 per cent-reduction of CO_2.[512] It applies differing reduction requirements for the emissions originating from heating fuel and for the emissions originating from motor fuel.[513] The consumption of heating fuels must be reduced by a total of 15 per cent, whereas the consumption of motor fuels (fuels for international flights excluded) must be reduced by 8 per cent.[514]

The committed reduction of CO_2 emissions is primarily to be achieved through voluntary measures on the part of companies and private individuals.[515] If the voluntary measures fail to produce the desired effect and compliance with the reduction targets of the CO_2-Act becomes unlikely, the CO_2-Act attributes the competence to the Federal Council to introduce a steering fee on fossil fuels (CO_2-Fee).[516] The CO_2-Act leaves the option to design differing CO_2-Fee systems for heating fuel and for motor fuel to the Federal Council.[517] The CO_2-Fee was to be introduced as of 2004 at the earliest.[518] The amount of the CO_2-Fee has to be approved by the Federal Assembly.[519]

The CO_2-Act does not explicitly create an Emission Trading Scheme.[520] It foresees the mechanisms on which the current CH-ETS is based on: The crediting of offsets effected elsewhere and the CO_2-Fee on emissions ef-

512 Article 2, paragraph 1 of the CO_2-Act.

513 In the EU-ETS, there is no explicit differentiation between heating and motor fuel. De facto, however, motor fuel is not covered by the EU-ETS because the transport sector is excluded from the EU-ETS.

514 Article 2, paragraph 2 of the CO_2-Act.

515 Article 3, paragraph 1 of the CO_2-Act.

516 Article 3, paragraph 2 and Articles 6 to 11 of the CO_2-Act. Regarding the nature of the CO_2-Fee see BORLAT, 1288: „*Cette taxe a la nature d'une taxe d'incitation*."

517 Article 7, paragraph 3 of the CO_2-Act: *"Der Bundesrat kann die Abgabesätze für fossile Brenn- und Treibstoffe nach Massgabe der Erfüllung der Reduktionsziele unterschiedlich festlegen. Er kann die CO_2-Abgabe auch nur auf Brennstoffen oder nur auf Treibstoffen erheben."*

518 Article 6, paragraph 3 of the CO_2-Act.

519 Article 7, paragraph 4 of the CO_2-Act.

520 Compared to establishment of the EU-ETS by an explicit ETS-Directive, the absence of any CH-ETS *"Founding Act"* is striking. The fact that the EU-ETS is based on an ETS-specific Directive demonstrates that the creation of an ETS became part of an international political agenda of the EU.

fected by individual companies as an instrument to protect the population and its natural environment as provided for in the Constitution.

4.2.2 CO_2-Crediting-Ordinance of 22 June 2005

In the Kyoto carbon market, states may offset their emissions by participation in emission reduction projects beyond national borders.[521] Likewise, the CO_2-Act provides for the use of emission units generated abroad and allocates the competence to decide on the adequate calculation of emission units from abroad to the Federal Council. [522]

With the *"Ordinance on the Crediting of Emission Reductions Achieved Abroad"* (CO_2-Crediting-Ordinance) of 22 June 2005, the Federal Council creates an unilateral link between the Kyoto carbon market and the Emission Trading Scheme in Switzerland.[523] The CO_2-Crediting-Ordinance entered into force on 1 January 2006.

The CO_2-Crediting-Ordinance limits the use of emission units from abroad to 2 million tCO_2e per year.[524] This amount corresponds to about half of the annual national reduction commitment according to the CO_2-Act.[525] In order to guarantee a certain level of quality and verification, the scope of emission units from abroad is limited to Certified Emissions Reductions (CERs) and Emission Reduction Units (ERUs) issued in accordance with Articles 6 and 12 of the Kyoto Protocol.[526] In addition, the CO_2-Crediting-Ordinance stipulates that *"authorisations" ("Bewilligungen")* granted abroad for the emission of a specific volume of CO_2 are admitted to the Swiss crediting system

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521 Article 6 of the Kyoto Protocol providing for *"Joint Implementation*"-projects (JI) and Article 12 of the Kyoto Protocol establishing the *"Clean Development Mechanism"* (CDM).

522 Article 2, paragraph 7 of the CO_2-Act: *"Verminderungen der Emissionen, die im Ausland erzielt und von der Schweiz oder von in der Schweiz ansässigen Unternehmen finanziert wurden, kann der Bundesrat bei der Berechnung der Emissionen nach diesem Gesetz angemessen berücksichtigen. Er regelt die Anforderungen und berücksichtigt dabei international anerkannte Kriterien."*

523 In a unilateral link, entities in system A can purchase and use units from system B for compliance but not vice versa. SCHÜLE/STERK, 5.

524 Article 5, paragraph 1 of the CO_2-Crediting-Ordinance.

525 FEDERAL COUNCIL, CO_2-Fee-Dispatch, 4899.

526 Article 2, paragraph 1, subparagraph a of the CO_2-Crediting-Ordinance.

"provided these authorisations have been issued by states with comparable emission trading regulations".[527]

According to the CO_2-Crediting-Ordinance, anyone who wishes to have accounted emission units achieved abroad to contribute to reaching the national reduction targets fixed in Article 2 of the CO_2-Act must submit an application to the Federal Office for the Environment (FOEN).[528] In the explanations concerning the CO_2-Crediting-Ordinance, it is clarified that this provision addresses, *"for instance"*, the sponsorship of the *"Climate Cent"*.[529]

4.2.3 CO_2-Fee-Ordinance of 8 June 2007

Foreseeable non-compliance with the targets of the CO_2-Act incited the Federal Council to become active. Simultaneously with the CO_2-Crediting Ordinance, on 22 June 2005, the Federal Council published its *"Dispatch on Approval of the CO_2-Fee for Fossil Heating Fuels"* asking for approval of the Federal Assembly for a proposed CO_2-Fee on heating fuel.[530]

Intense political controversy had forced the Federal Council to propose a discriminatory treatment of heating and motor fuel.[531] With the proposed

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527 Article 2, paragraph 1, subparagraph b of the CO_2-Crediting-Ordinance. It is not explicitly mentioned what kind of authorisation is referred to. Probably, the term is meant to open doors for future links with other Emission Trading Schemes.

528 Article 3, paragraph 1 of the CO_2-Crediting-Ordinance: *"Wer im Ausland erzielte Emissionsverminderungen auf das Reduktionsziel nach Artikel 2 des Gesetzes anrechnen lassen will, muss beim BAFU ein Gesuch einreichen."* In the EU-ETS, the Linking-Directive of the EU allows to use CDM and JI credits directly *„through the issue and immediate surrender of one allowance in exchange for one CER or ERU"* to offset reduction obligations. Preamble, paragraph 5 of the Linking-Directive, repeated in Article 11a, paragraph 1 of the Linking-Directive and introduced into the Consolidated ETS-Directive.

529 Explanations concerning CO_2-Crediting-Ordinance, 3. The accounting procedure for companies is addressed in Article 12 of the CO_2-Fee-Ordinance.

530 According to Article 7, paragraph 4 of the CO_2-Act, the amount of the CO_2-Fee on heating fuel has to be approved by the Federal Assembly.

531 For a summary of the Swiss climate policy of the past years see <http://www.wwf.ch/de/derwwf/themen/klima/klimapolitik/schweiz/>. New efforts to align the provisions for heating and for motor fuel failed. On 1 June 2010, the National Council voted with 108 against 82 again against the introduction of an Article providing for a CO_2-Fee on motor fuels in the Draft CO_2-Act. See <http://www.parlament.ch/ab/frameset/d/n/4814/326160/d_n_4814_326160_326182.htm>; On 8 March 2011, the Council of

CO_2-Ordinance of 22 June 2005, the Federal Council intended to introduce a CO_2-Fee of 35 CHF on heating fuel. Whereas for motor fuels, the so-called *"Climate Cent"* ("*Klimarappen")*[532] was introduced as of 1 October 2005, it took two years of tedious deliberations until the Federal Assembly decided in March 2007 to put forward a more modest CO_2-Fee on heating fuel with graduated introduction.[533] On 8 June 2007, the Federal Council accepted the Federal Assembly's proposal and the revised CO_2-Fee-Ordinance entered into force on 1 July 2007. The CO_2-Fee currently amounts to 36 CHF per tCO_2.[534] As a tax, the CO_2-Fee is unique because it is a pure steering tax which is redistributed to both the population and the business sector.[535]

The CO_2-Fee-Ordinance provides for Fee-exemption if a company concludes a voluntary Target Agreement with the Swiss authorities. Article 12 of the CO_2-Fee Ordinance stipulates that FOEN allocates "*CO_2 emission rights*" of the amount of the agreed reduction target.[536] The company consequently has to invalidate the *"emission rights"* corresponding to the effected emissions.[537]

States voted 21 against 16 in favour of anintroduction of an Article providing for a CO_2-Fee on motor fuels in the Draft CO_2-Act. See <http://www.parlament.ch/ab/frameset/d/s/4817/347688/d_s_4817_347688_347689.htm>.

532 The so-called *"Klimarappen"* corresponds, in fact, to 1.5 *"Rappen"* (0.015 CHF) for a litre of motor fuel.

533 A CO_2-Fee of 12 CHF per tCO_2 (corresponding to 0.03 CHF per litre heating fuel) in 2008, if the emissions from heating fuel in 2006 is reduced by less than 6 per cent compared to 1990; a CO_2-Fee of 24 CHF per tCO_2 (corresponding to 0.06 CHF per litre heating fuel) in 2009, if the emissions from heating fuel in 2007 is reduced by less than 10 per cent compared to 1990; CO_2-Fee of 36 CHF per tCO_2 (corresponding to 0.09 CHF per litre heating fuel) in 2008, if the emissions from heating fuel in 2008 is reduced by less than 13.5 per cent compared to 1990. Article 3, paragraph 1, subparagraphs a, b and c of the CO_2-Fee-Ordinance.

534 Status since 1 January 2010. See <http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=de&msg-id=27541>.

535 CLAASEN/ARNOLD. 56.

536 Article 12, paragraph 1 of the CO_2-Fee-Ordinance: *"Das BAFU teilt den von der Abgabe befreiten Unternehmen im Umfang des CO_2-Frachtziels CO_2-Emissionsrechte für die Jahre zu, in denen das Unternehmen von der Abgabe befreit ist. (...)"*

537 Article 12, paragraph 3 of the CO_2-Fee-Ordinance: *"Die von der Abgabe befreiten Unternehmen müssen die Emissionsrechte und Emissionszertifikate bis zum 1. Juni des Jahres, das auf die erstmalige Befreiung von der Abgabe folgt, und dann jährlich bis zum 1 Juni 2013 nach Massgabe der effektiven Emissionen entwerten."*

4.2.4 Post 2012-National Legislation

The CO_2-Act requires the Federal Council to propose new reduction targets for the period after 2010 *"accurately timed"*.[538] A first draft of a renewed CO_2-Act has been submitted to the Parliament by the Federal Council on 26 August 2009 accompanied with the *"Dispatch on Swiss Climate Policy after 2012"*.[539] The Federal Council proposed that the reform of the legislation takes the form of an indirect counter-proposal to the federal popular initiative *"For a healthy climate"*.[540]

The Draft CO_2-Act intends to continue and improve the existing Emission Trading Scheme for energy-intensive businesses in analogy to the basic provisions of the EU-ETS. The objective will be a link with the EU-ETS.[541]

Whereas in the current CO_2-Act emission trading is not directly addressed, the Draft CO_2-Act explicitly establishes an Emission Trading Scheme and contributes its entire Chapter 3 to emission trading and compensation. A second novelty of the Draft CO_2-Act is the reference to adaptation measures to climate change.[542]

For the adoption of the proposed Draft CO_2-Act, a one-year deadline was extended twice. According to current provisions, the Federal Assembly must agree on the Draft CO_2-Act by 29 August 2012.[543] The main discussion

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538 Article 2, paragraph 6 of the CO_2-Act.

539 See Press Release of 28 August 2009, available at <http://www.news.admin.ch/message/index.html?lang=en&msg-id=28680>.

540 The federal popular initiative *"For a healthy climate"* demands a reduction in emissions of GHG gases by a minimum of 30 per cent by 2020 versus the 1990 levels; this is to be achieved by implementing measures within Switzerland domestically. The background of the initiative is the objective of limiting global warming in the long term to a maximum of 2°C in comparison with the pre-industrial level.

541 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7474: *"Angestrebt wird ausserdem die Kompatibilität mit dem EG-Emissionshandelssystem (EG-ETS), um eine Verknüpfung der Systeme zu ermöglichen.*" See also <http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=en&msg-id=28680>. See also KECKEIS, 833.

542 Article 1, paragraph 2, subparagraph d of the Draft CO_2-Act.

543 According to the Decision of the Council of State of 1 June, available at <http://www.parlament.ch/ab/frameset/d/n/4819/356078/d_n_4819_356078_356079.htm>; and according to the Decision of the National Council of 8 June 2011, available at <http://www.parlament.ch/ab/frameset/d/n/4819/356078/d_n_4819_356078_356079.htm>.

points concern the reduction rate versus the 1990 level,[544] the tariffs of the CO_2-Fee[545] and the level of compensation requirement for manufacturers and importers of fossil motor fuels.[546] A further significant point is the question of compensation from abroad. Claiming conformity with the international requirement of supplementarity, the Draft CO_2-Act states that half of the emission reductions may be achieved through reduction measures abroad.[547]

There is a political controversy as to whether the Draft CO_2-Act in its current form is adequate. Proponents of emission trading are of the opinion that the provisions of 20 per cent domestic emission reductions and the CO_2-Fee on

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544 Article 3, paragraph 1 of the Draft CO_2-Act: *„Die Treibhausgasemissionen sind bis zum Jahr 2020 gegenüber 1990 gesamthaft um 20 Prozent zu vermindern. Der Bundesrat kann Zwischenziele festlegen"*. As a variation, it is proposed to reduce 30 per cent versus the 1990 level, if important emitters commit to comparable efforts. FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7489. See also BURKHARDT, 72.

545 Article 26, paragraph 2 of the Draft CO_2-Act: *"Der Abgabesatz beträgt je Tonne CO_2 36 Franken. Der Bundesrat kann ihn bis auf höchstens 120 Franken erhöhen, falls die CO_2-Emissionen aus Brennstoffen bis zum Jahr 2014 nicht um 18 Prozent und bis zum Jahr 2017 nicht um 21 Prozent gegenüber 1990 vermindert werden."* As a variation, a CO_2-Fee of 60 CHF is proposed with the possibility to raise the amount up to 180 CHF if the CO_2-emissions from heating fuel could not be reduced by 21 percent by the year 2014 and by 27 percent by the year 2017.

546 Article 23, paragraph 2 of the Draft CO_2-Act: *"1. Wer nach dem Mineralölsteuergesetz vom 21. Juni 1996 Treibstoffe in den steuerrechtlich freien Verkehr überführt, muss einen Teil der CO_2-Emissionen, die bei der energetischen Nutzung der Treibstoffe entstehen, kompensieren, indem er dem Bund Emissionszertifikate abgibt. 2. Der Kompensationssatz beträgt 25 Prozent. Der Bundesrat kann ihn bis auf höchstens 35 Prozent erhöhen, soweit dies zur Erreichung des Reduktionszieles nach Artikel 3 notwendig ist."* As a variation, a compensation of 40 per cent is proposed, which can be raised to 50 per cent.

547 Article 5, paragraph 2 of the Draft CO_2-Act. See also FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7472. The federal popular initiative *"For a healthy climate"*, on contrary, proposes an emission reduction of at least 30 per cent versus the 1990 level achieved without emission units from abroad entirely within Switzerland. The National Council, in its deliberations of June 2010, has agreed on a reduction target of minus 20 per cent to be achieved by domestic abatement measures only (*"Inlandkompensation"*). This decision is accompanied by the competence for the Federal Council to increase the reduction target to up to 40 per cent if other major emitters take comparable measures. In this case, only one fourth of the additional reductions must be achieved in-country. (See BUNDESAMT FÜR UMWELT (BAFU), "*Das revidierte CO_2-Gesetz nach der Nationalratsdebatte*", 26 July 2010 available at <http://www.bafu.admin.ch/klima/00493/06577/10620/index.html?lang=de>.) In March 2011, the Council of States followed the National Council's decision on the offset-provisions. The Council of States took this decision despite of the opposed recommendation of its Committee for the Environment, Spatial Planning and Energy.

motor fuel as foreseen in the current Draft CO_2-Act is detrimental and, therefore, should be opposed by a referendum or, as an alternative, the validity of the current CO_2-Act shall be extended by parliamentary initiative.[548] Other economic groups, to the contrary, consider the Draft CO_2-Act with its 20 per cent domestic reduction as an opportunity for Swiss companies to increase Switzerland's worldwide role as a "*cleantec-pioneer*". In their view, 20 per cent domestic reduction can be achieved without any economic disadvantages - well to the contrary.

The extension of the current CO_2-Act could, indeed, be an elegant way to continue what has been functional so far. A hasty decision on a new regime and a hasty implementation risks to preclude deficient or imperfect details. In addition, an extension of the current CO_2-Act would allow a deepened discussion about advantages and disadvantages of a linkage of the CH-ETS with the EU-ETS.

4.3 Coverage of the Swiss Emission Trading Scheme (CH-ETS)

The CO_2-Act's objective is to reduce the emissions in the current period primarily through voluntary measures.[549] *"Emission allowances"*[550] are allocated to companies as a result of a voluntary Target Agreement *("Zielvereinbarung")* with the Swiss authorities.[551] The design of the voluntary measures and the Target Agreements are facilitated by a mandated agency.[552]

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548 MARKUS HOFMANN, „*Klimagesetz verlängern statt revidieren*", in: Neue Zürcher Zeitung (NZZ), 9 September 2011, 13.

549 Article 3, paragraph 1 of the CO_2-Act. See also Article 4 of the CO_2-Act, providing for voluntary measures not only in the heating fuel sector, but also in the motor fuel sector. The privately established Swiss *"Climate Cent Foundation",* therefore, contracted agreements with some 83 companies in the motor fuels sector. Overall, these agreements should yield emissions reductions of 0.22 million tonnes of CO_2 over the period 2008 to 2012, at a pre-agreed price of 125 CHF per tonne. See <http://klimarappen.ch/en/programmes/target-agreements.html>.

550 *"Allowance"* is the term used by the translation of the CO_2-Crediting-Ordinance by the Swiss authorities. In this thesis, the term is only used when referring to a direct or indirect citation of a text of the Swiss authorities. When referring to tradable emission units in general, the term *"emission unit*" is used.

551 Article 12, paragraph 1 of the CO_2-Fee-Ordinance: *"Das BAFU teilt den von der Abgabe befreiten Unternehmen im Umfang des CO_2-Frachtziels CO_2-Emissionsrechte für die*

The Swiss Federal Office for the Environment (FOEN) agreed with the UNFCCC secretariat that the assigned amount per year for Switzerland is 48.25 million tCO_2e according to the Kyoto provisions.[553] This assigned amount requires a yearly net reduction of more than 4.5 million tCO_2e per year.[554]

The CH-ETS covers, according to a publicly available list on the internet, currently 435 installations with allocated emission units.[555] These 435 installations account for about 3 million allocated tCO_2e per year.[556] The CH-ETS, consequently, equals the size of about 0.15 per cent of the size of the EU-ETS.[557]

4.3.1 Periods

The CO_2-Act states that the national emission reduction target of 10 per cent applies to the year 2010.[558] Decisive for the determination of compliance are

Jahre zu, in denen das Unternehmen von der Abgabe befreit ist. (...)" According to BORLAT, 1289, almost 1'000 companies have negotiated a Target Agreement by 2010 and obtained exemption from the CO_2-Fee in return. BORLAT, an employee of the DETEC himself, reports on one appeal against a Target Agreement filed with the DETEC so far.,

552 Article 4, paragraph 2 of the CO_2-Act: *„Der Bund kann geeignete Organisationen mit der Unterstützung und der Durchführung freiwilliger Massnahmen beauftragen."* Article 29, paragraph 3 of the CO_2-Fee-Ordinance providing for support by mandated agencies according to Article 16 and Article 18 of the Energy Act of 26 June 1998, SR 730.0.

553 See <http://www.bafu.admin.ch/emissionshandel/05538/05540/index.html?lang=en>.

554 According to the initial report under the Kyoto protocol, Switzerland has a calculated base-year emission of 52'790'957 tCO_2e. <http://unfccc.int/files/national_reports/initial_reports_under_the_kyoto_protocol/application/pdf/initial_report_-_update_following_review.pdf>. The difference between the base-year emission and the assigned amount per year corresponds to the yearly net reduction requirement.

555 See NAP of Switzerland, available at <https://www.national-registry.ch/ListePnaq.aspx?Period=01&menu=yes>, accessed on 14 November 2011.

556 KECKEIS, 831. The total allocation for the period 2008 to 2012 amounts to 16'346'705 tCO_2e. Calculated on the basis of the NAP of Switzerland, available at <https://www.national-registry.ch/ListePnaq.aspx?Period=01&menu=yes>.

557 In the EU-ETS, the final allocations of emissions units in phase II amounts to almost 2'000 million tCO_2 per year. GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12.

558 Article 2, paragraph 1, of the CO_2-Act: "*Die CO_2-Emissionen aus der energetischen Nutzung fossiler Energieträger sind bis zum Jahr 2010 gegenüber 1990 gesamthaft um 10 Prozent zu vermindern (...).*"

the average emissions during the period from 2008 to 2012.[559] Or, expressed differently: The reduction target for the year 2010 must on average be maintained also over the whole period 2008 to 2012.[560]

The CO_2-Fee-Ordinance provides for the transposition of the national emissions reduction target into individual targets for companies. Because a Target Agreement entails the exemption from the CO_2-Fee and because a Target Agreement may be concluded as of any starting date, the relative provision in the CO_2-Fee-Ordinance uses the complicated formula: *"The reduction target is set for 2010. Decisive is the average of the years of CO_2-Fee-exemption of the company."* [561]

The Draft CO_2-Act defines 2020 as the new target year.[562] Emission units which were not used in the first period 2008 to 2012 can be used in the subsequent period without restriction.[563] In his Climate Policy after 2012-Dispatch, the Federal Council stresses that 2020 as the new target year remains the same regardless of the outcome of international negotiations on climate change policies.[564] It thereby adheres to the decision taken by the EU to design 2013 to 2020 as the next commitment period.

4.3.2 Gases covered

The CO_2-Act covers, as its name indicates, CO_2 as the most eminent of all GHG emitted by the use of fossil energy.[565] These CO_2 emissions from fossil heating and motor fuel cover some 80 per cent of the total GHG emissions in

559 Article 2, paragraph 1, phrase 2 of the CO_2-Act: *„Massgebend für die Erreichung dieses Ziels ist der Durchschnitt der Jahre 2008 bis 2012."*

560 Explanations concerning the CO_2-Fee-Ordinance, 4.

561 Article 7, paragraph 2 of the CO_2-Fee-Ordinance: *„Das Begrenzungsziel wird für das Jahr 2010 festgelegt. Massgebend für die Zielerreichung ist der Durchschnitt der Jahre, in denen das Unternehmen von der Abgabe befreit ist."*

562 Article 3, paragraph 1 of the Draft CO_2-Act.

563 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7475.

564 FEDERAL COUNCIL, Climate Change after 2012-Dispatch, 7466.

565 Article 1 of the CO_2-Act: *„Mit diesem Gesetz sollen die CO_2-Emissionen vermindert werden, die auf die energetische Nutzung fossiler Energieträger (Brenn- und Treibstoffe) zurückzuführen sind (….)."*

Switzerland.[566] GHG emission sources from international aviation and from other sources than the use of energy are not covered.[567]

The fact that, unlike the coverage of the Kyoto Protocol, only CO_2-emissions are covered by the current CO_2-Act, is perceived as a disadvantage. In its Climate Policy after 2012-Dispatch, the Federal Council proposes that, henceforth, the scope of covered gases by the Swiss legislation shall be identical with the scope of the international legislation.[568] The Draft CO_2-Act consequently addresses all the GHG emissions, *"in particular the CO_2-emissions originating from the use of fossil energy"*.[569]

However, since only companies with a voluntary Target Agreement are included in the scheme, the CH-ETS covers only 12 per cent of the CO_2-emissions from heating fuel and 6 per cent of all the CO_2-emissions in Switzerland.[570] The quantity of the GHG gases included in the CH-ETS, hence, is very modest compared to the quantity of GHG emitted in the Non CH-ETS sector. (Figure 6)

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566 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7460.

567 Article 2, paragraph 2 of the CO_2-Act: *"Die Emissionen aus der energetischen Nutzung fossiler Brennstoffe sind gesamthaft um 15 Prozent und die Emissionen aus fossilen Treibstoffen (ohne Flugtreibstoffe für internationale Flüge) gesamthaft um 8 Prozent zu vermindern."* Not covered, apart from international aviation, are GHG emissions in agricultural and industrial production, the carbon increment in the biomass (sinks), carbon as a result of waste incineration and the not-energetically caused CO_2 in cement production. See FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7460.

568 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7460 and 7488. However, this intention is not reflected in the text of the Draft CO_2-Act.

569 Article 1, paragraph 1 of the Draft CO_2-Act: *„Mit diesem Gesetz sollen die Treibhausgasemissionen, insbesondere die CO_2-Emissionen, die auf die energetische Nutzung fossiler Energieträger (Brenn- und Treibstoffe) zurückzuführen sind, vermindert werden. (...)"*

570 According to calculations of ENAW. Interview with Dr. Armin Eberle and Mr. Oliver Luder, 19 November 2010. In a press release of the Council of the European Union issued on 20 December 2010, it was calculated that the CH-ETS applies to around 6.5 per cent of the 52 million tCO_2e emitted by Switzerland per year. COUNCIL OF THE EUROPEAN UNION, "*EU to link its greenhouse gas emissions trading system with Switzerland*", Brussels 20 December 2010, available at <http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/envir/118632.pdf>.

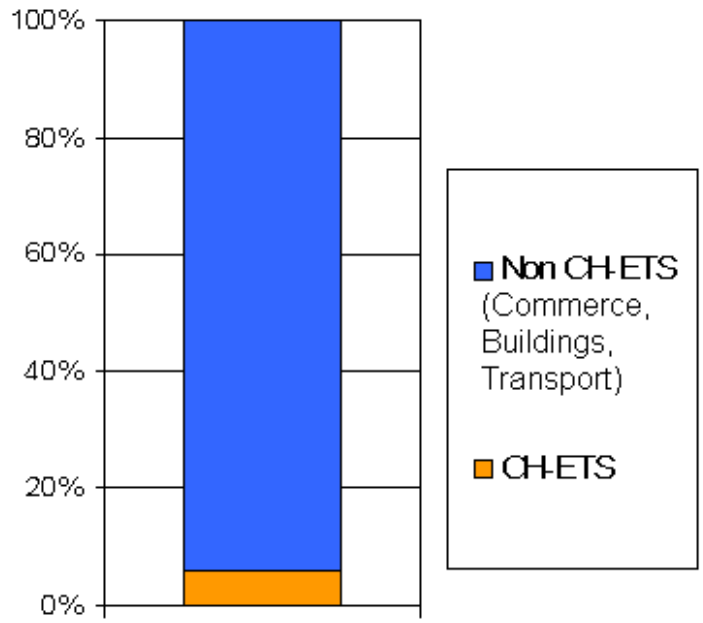

Figure 6: CH-ETS Sectors versus Non CH-ETS Sectors
The CH-ETS covers only about 6 per cent of all the CO_2-emissions in Switzerland.

4.3.3 Sectors and Allocation

4.3.3.1 Sectors and Allocation through Target Agreements

The allocation of emission units to Swiss companies is triggered by a Target Agreement, a voluntary measure according to the current CO_2-Act. Target Agreements may be concluded as a single company or in a group of companies.[571] The Target Agreement includes an absolute *"freight aim*" and an "*intensity aim*" as a relative indicator for the effectiveness of the measures.[572] The freight aims are adjusted each year in relation to the company's

[571] Article 5, paragraphs 2 and 3 and Article 8, paragraph 1 of the CO_2-Fee-Ordinance provide for Target Agreements concluded by a group of companies. If a group of companies does not meet its target, the individual target of each company is decisive for determination of (non-)compliance. Article 18, paragraph 3 of the CO_2-Fee-Ordinance.

[572] Article 8, paragraph 1 of the CO_2-Fee-Ordinance.

production growth, with the final adjustment taking place in 2010.[573] Having reached and concluded a Target Agreement with the competent Swiss authorities, the Confederation issues in an Act of Disposal the company's respective emission units.[574]

The conclusion of Target Agreements is facilitated by the *"Energy Agency for the Economy"* (ENAW) which was founded in 1999 as a result of the discussions which led to the current CO_2-legislation. Its purpose is to be a service-provider for industrial companies according to Article 29, paragraph 3 of the CO_2-Fee-Ordinance. It consults member-companies how to reduce CO_2-emissions by increasing energy efficiency through the economically most profitable measures. A respective framework agreement with the Swiss authorities was concluded in 2001.[575]

ENAW supports companies calculating their reduction options by using a *"bottom-up"* approach: a company's potential to reduce emissions from a technical and economic viewpoint is assessed on the basis of projected production and emissions, taking into account any CO_2 reduction measures already implemented.[576]

Due to the different starting positions, ENAW divides the addressed companies into three groups: the Energy-Model for large scale consumers (*"Energie-Modell")*, the *"Benchmark-Model"* for small and medium-sized companies with intensive energy consumption and the SME-Model *("KMU-Modell")* for other small or medium-sized business entities.

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573 Article 8, paragraph 2 of the CO_2-Fee-Ordinance and Enforcement Instruction of 2 July 2007, revised on 22 December 2009, 18. The so-called "*ex-post adjustment*" is not foreseen any more for the post-2012 regime.

574 Article 12, paragraph 1 of the CO_2-Fee-Ordinance: *„Das BAFU teilt den von der Abgabe befreiten Unternehmen im Umfang des CO-Frachtziels CO_2-Emissionsrechte für die Jahre zu, in denen das Unternehmen von der Abgabe befreit ist. Frachtzielanpassungen verändern den Bestand der Emissionsrechte. Wurden einem Unternehmen zu viele Emissionsrechte zugeteilt, so kann ihm das BAFU Emissionsrechte entziehen.*" According to an interstate treaty, companies located in Liechtenstein may also conclude a Target Agreement beginning in 2010. See ENAW, Tätigkeitsbericht, 14.

575 ENAW, Tätigkeitsbericht, 10. The framework agreement was renewed in 2004 and 2008 and expires, according to the current agreement, in 2012.

576 In order to conclude Target Agreements, their energy consumption has to be recorded and efficiency potentials have to be identified that can be exploited while maintaining economic viability. With support of an expert from the ENAW, a basic forecast is then made regarding the development of CO_2 emissions up to 2010. This is used for defining the targets for CO_2 emissions. See <http://www.bafu.admin.ch/emissionshandel/05538/05540/index.html?lang=en>.

Only Target Agreements with companies adhering to the Energy-Model trigger emission units to the extent of the targeted emissions for 2008 and 2009 and three times the targeted emissions for 2010. Companies adhering to the Benchmark-Model commit to emission reductions in percentage and are not allocated any emission units for trading. The same principle applies to SME-companies which may buy emission units for compliance but don't receive any emission units for trading.[577]

Since 1999, some 2000 companies from industry, business and service sectors have decided to cooperate with ENAW.[578] Less than a quarter of these companies are CH-ETS-participants.

4.3.3.2 Post 2012-Sectors

In contrast to the current system, the Draft CO_2-Act defines emission trading to be a self-contained instrument a part from the CO_2-Fee and the instrument of CO_2-Fee exemption through the conclusion of a Target Agreement.[579] It differentiates between two categories of ETS-participating companies: Article 12 addresses companies which may be included in the CH-ETS, Article 13 addresses companies whose inclusion in the CH-ETS is mandatory. As under the current legislation, participating companies in the CH-ETS will be exempt from the CO_2-Fee.[580]

The Draft CO_2-Act delegates the competence to decide on the inclusion of industrial sectors into the CH-ETS to the Federal Council.[581] According to the Climate Policy after 2012-Dispatch, a participation in the CH-ETS will be mandatory for companies with yearly emissions of more than 10'000 tCO_2e from specific sectors.[582] Voluntary may be the participation for en-

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577 Enforcement Instruction of 2 July 2007, revised on 22 December 2009, 17-20. See also <http://www.bafu.admin.ch/emissionshandel/05545/index.html?lang=en>.

578 The 2000th company has joined ENAW in December 2010. See <http://www.pressepor tal.ch/de/pm/100005471/100615763/die-enaw-feiert-2000-klimaschuetzer-ehrung-der-fir men-dambach-ag-und-schenk-gmbh>.

579 KECKEIS, 834.

580 Article 14 of the Draft CO_2-Act.

581 Article 12, paragraph 3 of the Draft CO_2-Act: *„Der Bundesrat bezeichnet die Wirtschaftszweige. (...)"*

582 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7474, spells out the limit of 10'000 tCO_2e. It is not mentioned in the Draft CO_2-Act. Sectors: Power supply (e.g. combined heat and power plant, cogeneration plant for heat and power), coking plant and petroleum processing (e.g. refineries), metal production and machining (e.g. raw iron and steel), production of metal produces, production of glass, glassware, ceramic,

ergy-intensive companies with more than 5'000 tCO_2e yearly emissions.[583] It is estimated that these provisions concern about 50 sites, 85 per cent of which participate already today in the CH-ETS.[584] Newly added will be refineries, some power supply sites and some chemical industry sites. Aviation, however, has not been in consideration to be included in the CH-ETS so far.

Studies assume that the CH-ETS as designed by the Draft CO_2-Act will cover the emissions of around 6 million tCO_2e, including almost 100 companies with 130 facilities. The majority of the emissions, about 5 million tCO_2e, will be emitted by only 30 facilities with a yearly freight *("Jahresfracht*") of over 25'000 tCO_2e each.[585]

4.3.3.3 Post 2012-Allocation

The Draft CO_2-Act remains vague regarding the allocation of emission units. It foresees a yearly free-of-charge allocation of emission units *"in so far as they are necessary for the GHG-efficient operation"*. The rest of the emission units are to be auctioned.[586] The Federal Council is competent to regulate the details *"taking into consideration comparable international regulation"*.[587]

According to a study of FIRST CLIMATE/ECONABILITY, most of the Swiss companies included in the ETS belong to a sector which, according to the EU regulation, is inclined to carbon leakage.[588] Therefore, if respective EU provisions are incorporated by Switzerland, auctions of emissions units for the period from 2013 to 2020 can be expected to be rare.

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manufacturing of stones and earths (e.g. cement, lime and bricks), manufacturing of cellulose, pulp and paper, manufacturing of chemical produces and refuse incineration plants. FIRST CLIMATE/ECONABILITY, 57, estimates that some 43 companies will have to participate in the CH-ETS on a mandatory basis.

583 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7474, spells out the limit of 5'000 tCO_2e. It is not mentioned in the Draft CO_2-Act.

584 FIRST CLIMATE/ECONABILITY, 9.

585 FIRST CLIMATE/ECONABILITY, 7 and also 134.

586 Article 16, paragraph 2 of the Draft CO_2-Act: *"Sie werden kostenlos zugeteilt, soweit sie für den treibhausgaseffizienten Betrieb der ETS-Unternehmen notwendig sind. Die übrigen Emissionsrechte werden versteigert*."

587 Article 16, paragraph 3 of the Draft CO_2-Act: *"Der Bundesrat regelt die Einzelheiten und berücksichtigt dabei vergleichbare internationale Regelungen."*

588 FIRST CLIMATE/ECONABILITY, 57.

4.4 Definition and Recognition of Trading Units

4.4.1 Measurement of a Trading Unit

Being a Party to the Kyoto Protocol, the Swiss system for the accounting of emissions is based on the same unit of *"one metric tonne of carbon dioxide equivalent"*, translated into *"tCO_2 equivalent"* or, in short, *"tCO_2e"*.[589]

The CO_2-Crediting-Ordinance of 22 June 2005 foresees two categories of emission units eligible to be accounted in the CH-ETS: Certificates (*"Zertifikate"*) according to Article 6 and 12 of the Kyoto Protocol and authorizations (*"Bewilligungen"*) to emit a defined amount of CO_2 provided that these authorizations have been issued in states with comparable emission trading rules.[590] The over-all term for all securitized emission units used by the Swiss authorities at the time was "*emission credits"*.[591]

The Draft CO_2-Act published on 26 August 2009, however, deviates from this linguistic practice by defining *„emission rights*" (*„Emissionsrechte"*) as tradable *"authorizations*" *("Bewilligungen"*) for emitting a defined amount of GHG gases.[592] "*Emission certificates"* ("*Emissionszertifikate"*) are de-

589 Almost all schemes currently emerging do in fact rely on the same quantitative unit of trading based on the Kyoto Protocol. The one exception is the Regional Greenhouse Gas Initiative (RGGI) in the north-eastern and mid-atlantic States, a scheme based on *"short tonnes"*, which is less than a metric tonne (namely 907.18474 kg). SCHÜLE/STERK, 12.

590 Article 2, paragraph 1 a) and b) of the CO_2-Crediting-Ordinance.

591 FOEN, Emission Credits, Offsetting and Trading, 1. See also Explanations to the Registry-Ordinance of 27 September 2007, 2, Fn.3: *"Die vom BAFU zugeteilten Rechte werden als "Emissionsrechte" bezeichnet. Emissionsgutschriften aus Projekten in Entwicklungsländern (sog. CDM nach Artikel 12 des Kyoto-Protokolls) und aus anderen Industrie- oder Transitionsländern (sog. JI nach Artikel 6 des Kyoto-Protokolls) sind „Zertifikate". Als Oberbegriff für die „Emissionsrechte" und die „Zertifikate" wird der Begriff „Emissionsgutschriften" verwendet."*

592 Article 2, paragraph 3 of the Draft CO_2-Act: *"Emissionsrechte sind handelbare Berechtigungen zum Ausstoss von Treibhausgasen, die vom Bund oder von Staaten mit vom Bundesrat anerkannten Emissionshandelssystemen zugeteilt werden."* Whether the carbon market's traded good constitutes a property right is, however, ambiguous and widely disputed. For a comprehensive summary of the discussion see WEMAERE/STRECK/CHAGAS, chapter 3.1. "*The ethical dimension"*, 37-40.

fined, in accordance to the current practice, as internationally recognized attestations on emission reduction units achieved abroad.[593]

4.4.2 Certificates - Offsetting from Abroad

Emission units generated abroad according to the provisions of the Kyoto Protocol may be purchased and transferred by private companies or, in parallel, by governments as the Kyoto Protocol facilitates international government trading at the country level. Hence, both private entities and governments may undertake project-based emission reductions in developing countries via the CDM.[594]

The current CO_2-Act accords the competence to decide on the crediting of emission reductions achieved abroad to the Federal Council.[595] Whereas the FOEN is the responsible Office for the implementation of the Kyoto Protocol's legal requirements in Switzerland, a national Secretariat called *"Swiss-flex"* has been established within the Climate Division of the FOEN responsible for the flexible mechanisms. The national Secretariat represents the Swiss Designated National Authority (DNA) under the Clean Development Mechanism as well as the Designated Focal Point (DFP) under Joint Implementation.

Guidelines of the FOEN spell out the general requirements: An entity or person domiciled in Switzerland and wishing to participate in a CDM project activity and to transfer resulting CERs from the CDM Registry into an account of the Swiss national register requires a *"Letter of Approval"* from the Swiss DNA under the Clean Development Mechanism.[596] The accounted reductions in emissions from abroad are recorded in the National Registry

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593 Article 2, paragraph 4 of the Draft CO_2-Act: *„Emissionszertifikate sind international anerkannte handelbare Bescheinigungen über im Ausland erzielte Emissionsverminderungen.*" However, there is no definition of the legal nature of emission units in the Swiss jurisdiction. ZUMBACH, 36.

594 ANGER, 2045.

595 Article 2, paragraph 7 of the CO_2-Act: *„Verminderungen der Emissionen, die im Ausland erzielt und von der Schweiz oder von in der Schweiz ansässigen Unternehmen finanziert wurden, kann der Bundesrat bei der Berechnung der Emissionen nach diesem Gesetz angemessen berücksichtigen. Er regelt die Anforderungen und berücksichtigt dabei international anerkannte Kriterien.*"

596 Switzerland's National Guidelines and Procedures for Approving Article 12 Projects, most recent edition dated 18 November 2010, available at <http://www.bafu.admin.ch/emissionshandel/05556/05558/index.html?lang=en>.

and shadowed to the national account of Switzerland as an Annex-B Party of the Kyoto Protocol.[597]

Although Switzerland, in principle, accepts all types of projects which are in accordance with the Kyoto Protocol, there are qualitative restrictions with regard to eligibility of CDM-projects. The use of certificates generated through projects with nuclear plants or gigantic hydroelectric power and the use of certificates generated through projects using genetically modified organisms (GMOs) is restricted.[598]

With regard to quantity, the CO_2-Act demands that the crediting must be *"adequate*".[599] The CO_2-Crediting Ordinance states more precisely that with regard to Switzerland's commitment on international level reductions in emission achieved abroad may be credited to the reduction target for the years 2008 to 2012 to the extent of a maximum average of 2.0 million tCO_2e per annum.[600]

On company level, companies with a Target Agreement may, as a general principle, fulfil a maximum of 8 per cent of their CO_2 emission target by means of reductions in emissions achieved abroad.[601]

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597 Article 3, paragraph 3 of the CO_2-Crediting-Ordinance.

598 Switzerland's National Guidelines and Procedures for Approving Article 12 Projects, 1-2: "*The Swiss DNA accepts all types of projects which are in accordance with the Kyoto Protocol. Activities related to the construction or rehabilitation of nuclear plants are not considered as being in accordance with these provisions. Afforestation and reforestation projects using genetically modified organisms (GMOs) or alien invasive species are not eligible for a Swiss Letter of Approval or Authorization. In the case of hydroelectric power projects generating more than 20 megawatt, project participants are required to provide prove of respected recommendation contained in the report of the World Commission on Dams and the relevant international criteria and guidelines. Apart from the criteria listed above, the issuance of the Letter of Approval or Authorization may be refused only in exceptional cases, where projects are in breach of Swiss Foreign or Development Policies."*

599 Article 2, paragraph 7 of the CO_2-Act.

600 Article 5, paragraph 1 of the CO_2-Crediting-Ordinance. Amended in accordance with No. I of the Ordinance of 26 August 2009, in force since 1 November 2009 (AS 2009 4781).

601 Article 5, paragraph 2 of the CO_2-Crediting-Ordinance. See also Enforcement Instruction, 19, with regard to Energy-Model companies and see also Enforcement Instruction, 20, with regard to Benchmark-Model companies.

Fossil fired power plants, the permit of which is linked to the obligation to fully compensate their emissions, may offset up to 30 per cent by emission units from abroad.[602]

Also for companies under Article 9 of the CO_2-Fee-Ordinance, this share amounts to a maximum of 30 per cent.[603] Companies are covered by Article 9 of the CO_2-Fee-Ordinance if a reduction within the entity is technically not possible or economically not affordable. In the explanation to the CO_2-Fee-Ordinance, the example of newly entering companies with production sites according to the newest technical standard is mentioned.[604]

4.4.3 Reduction Units bought by the Swiss *"Climate Cent Foundation"*

With the CO_2-Fee-Dispatch of 22 June 2005, not only the CO_2-Fee on heating fuel was introduced. In addition, the commercially set up Climate Cent on motor fuels was granted a temporal testing phase.[605] With the income generated by the Climate Cent, the *"Climate Cent Foundation"* acquires CO_2 emission reductions generated by companies which have concluded a voluntary Target Agreement with the Swiss Confederation. The Foundation has committed to compensate for a total of 2.4 million tCO_2e out of which only 2 million tCO_2e may be compensated through emission units from abroad.[606]

If, by 2007, no apparent emission reductions in the motor fuel sector were achieved, the Federal Council was to introduce a CO_2-Fee on motor fuel in analogy to the CO_2-Fee on heating fuel.[607]

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602 HAUSER, 821/822, referring to the amendment of the CO_2-Act of 18 June 2010, in force as of 1 January 2011.

603 Article 5, paragraph 2 of the CO_2-Crediting-Ordinance.

604 Explanations concerning CO_2-Fee-Ordinance, 5.

605 The concept of the *"climate cent"* as a voluntary measure in accordance with the Swiss carbon law was developed and refined over the years 2001 to 2003. The task was to coordinate the concept within the wider context of climate policy. On the history of the Climate Cent-Foundation see <http://klimarappen.ch/fileadmin/Downloads/Geschichte_Klimarappen_EN.pdf>.

606 BURKHARDT, 74.

607 FEDERAL COUNCIL, CO_2-Fee-Dispatch, AS 2005 0801. An additional agreement was signed in February 2009, in which the Foundation committed to achieve further CO_2 reductions. On 1 June 2010, the National Council voted with 108 against 82 against the in-

The Climate Cent Foundation has acquired over-fulfilments by 243 companies in the heating fuel sector with Target Agreements, amounting to 1.31 million tonnes of CO_2 over the period 2008 to 2012. In the first auction round, CO_2 emission reductions were acquired at a price of 70 CHF, in the second auction round at a price of 100 CHF per tonne.[608]

Compared to the prices of EUAs in the EU-ETS which have fallen from over 30 EUR in 2008 to about 15 EUR in 2009/2010 and, finally, to 10 EUR in November 2011, the prices paid by the Climate Cent Foundation cannot be considered as true market prices.[609]

4.5 Compliance Issues

The compliance regime of an Emission Trading Scheme comprises the entirety of the provisions that ensure participants hold emission units equal to their effected emissions during the relevant compliance period.[610]

4.5.1 Monitoring, Reporting and Verification (MRV)

Monitoring, reporting and verification in Switzerland is regulated through the CO_2-Fee-Ordinance. CO_2-Fee exempted companies must report to national authorities over mandated agencies.[611] These are the same agencies as the ones mandated for the support in concluding a Target Agreement, namely

troduction of an Article providing for a CO_2-Fee on motor fuels in the Draft CO_2-Act. See <http://www.parlament.ch/ab/frameset/d/n/4814/326160/d_n_4814_326160_326182.htm >; On 8 March 2011, the Council of States voted 21 against 16 in favour of an introduction of an Article providing for a CO_2-Fee on motor fuels in the Draft CO_2-Act. See <http://www.parlament.ch/ab/frameset/d/s/4817/347688/d_s_4817_347688_347689.htm>.

608 See <http://klimarappen.ch/en/programmes/target-agreements.html>. About on fifth of the Climate Cent Foundation's total commitments was spent for domestic projects. See NEUE ZÜRCHER ZEITUNG (NZZ), *"Ein Bärendienst für den Klimaschutz"*, 30 March 2011, 26.

609 For a historical overview over the price development for EUAs see POINTCARBONNEWS, Volume 09, Number 28, 16 July 2010, available at <http://www.firstclimate.com/uploads/media/CarbonMarketEurope.pdf>.

610 HAITES/MULLINS, 57.

611 Article 11, paragraph 1 of the CO_2-Fee-Ordinance.

ENAW.[612] The *"Enforcement Instruction of FOEN and SFOE to the ENAW"* of 2 July 2007, revised on 22 December 2009, substantiates the requirements for Target Agreements and their implementation. According to the Enforcement Instruction, it is the responsibility of the CO_2-Fee exempted company to provide for the yearly entering of the data and for the accuracy of the data. This responsibility shall be lived up to *"with highest diligence"*.[613]

Monitoring, reporting and verification issues are addressed by chapter M of the Enforcement Instruction.[614] ENAW has developed a monitoring system to support the implementation of the Target Agreements which is based on measures aimed at reducing energy consumption on the one hand and based on consumption fuel economy data on the other hand.[615]

The verification is done by ENAW whose moderators check the entered data thoroughly. In a second step, random queries by ENAW search for inconsistencies and peculiarities.[616] The monitoring application is the basis for the data which is fed into the National Registry.[617]

With the Draft CO_2-Act, no substantial changes in the monitoring system are foreseeable. ETS-companies will have to continue to report on a yearly basis.[618] However, there is an indication that the introduction of the Monitoring Guidelines of the EU is likely.[619] Within chapter 3 in the Draft CO_2-Act on emission trading and compensation, the Federal Council receives the compe-

612 Article 29, paragraph 3 of the CO_2-Fee–Ordinance, in accordance with Article 16 and Article 18 of the Energy Act of 26 June 1998, SR 730.0.

613 Enforcement Instruction of 2 July 2007, revised 22 December 2009: *"Unternehmen, die von der CO_2-Abgabe befreit sind, sowie freiwillige Zielvereinbarer haben ihren Pflichten zur Berichterstattung und Monitoring mit grösster Sorgfalt nachzukommen (...)*"

614 The provisions for monitoring in the CH-ETS are very modest compared to the monitoring, reporting and verification provisions in the EU-ETS. The Monitoring Guidelines of the EU-ETS contain 85 pages.

615 ENAW, Tätigkeitsbericht, 5.

616 Enforcement Instruction of 2 July 2007, revised 22 December 2009, 29.

617 The public does not have any access to the monitoring data. Interview with Dr. Armin Eberle and Mr. Oliver Luder on 19 November 2010.

618 Article 17 of the Draft CO_2-Act.

619 The new Monitoring Guidelines of the EU, dated 18 July 2007, contain 85 pages. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:229:0001:0085:EN:PDF>.

tences to regulate on specifications concerning the allocation of emission units and, thereby, *"considers comparable international regulation"*.[620]

Although drafting the details of the MRV mechanisms is left to the Member States, the Monitoring Guidelines of the EU are, compared to the current Swiss provisions, very comprehensive. The European Commission recognized that these differences in practice are not deemed to comply with the requirements of the internal market and might generate higher costs than necessary.[621] In case of a linkage, Switzerland will have to harmonize its provisions with the ambitious MRV-requirements in the EU and, assumably, will have to increase MRV efforts considerably.

4.5.2 Registration

All units, the Kyoto units as well as European or Swiss Units, exist exclusively unchartered and in electronic form.[622] Every transaction, hence, must be recorded in a registry which centralizes the accounting data, provides transparent monitoring of reductions, and tracks transactions to avoid the double counting of reductions. The registry's purpose is to assure that reductions are maintained over time and are not sold more than once through transparent reporting and tracking of reductions.[623] After the incidents of *"cyber theft"* which occurred in the EU-ETS in January 2011,[624] the Swiss National Registry has made the *"four-eyes-principle"* mandatory for every transaction as of summer 2011.[625]

Since the CH-ETS has established an unilateral link with the Kyoto carbon market by accepting emission units from abroad, all transactions with CERs/ERUs must be recorded in the National Registry to account for com-

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620 *"Der Bundesrat regelt die Einzelheiten und berücksichtigt dabei vergleichbare internationale Regelungen.*" Article 16, paragraph 3 of the Draft CO_2-Act.

621 EUROPEAN COMMISSION, "*Impact Assessment"*, 71.

622 Article 12, paragraph 2 of the CO_2-Fee-Ordinance. For general information see <http://www.bafu.admin.ch/emissionshandel/05564/index.html?lang=en>.

623 PASSERO, 523.

624 The Commission closed the registries to market transfers of EUA emissions permits on 19 January 2011 as news came to light that security of the online registry systems had been breached in the Czech Republic, Austria and Greece. See CARBONPOSITIVE, Carbon News and Info, 31 January 2011, available at <http://www.carbonpositive.net/viewarticle.aspx?articleID=2253>.

625 As informed on the homepage of the National Registry, available at <https://www.national-registry.ch/>, accessed on 9 August 2011.

pliance with the Article 3.1-commitment of the Kyoto Protocol.[626] For simplicity, Switzerland uses the National Registry also in the national CH-ETS. The National Registry is an online accounting system which ensures the accurate recording of emission units. Each of the emission units has an unambiguous serial number. Every transaction is checked and confirmed by the International Transaction Log (ITL) which is established and run by the Secretariat to the UNFCCC in Bonn.[627]

The responsibility for the National Registry in Switzerland is accorded to the FOEN.[628] Rules regarding the National Registry were published in the Ordinance of the FOEN on the National Registry of 27 September 2007 *("Registry-Ordinance"*). Article 1 of the Registry-Ordinance stipulates that any company or person to receive or trade with emission units must dispose of an account in the National Registry: an operator's account ("*Betreiberkonto*") for companies with assigned emission units; a personal account (*"Personenkonto"*) for persons without assigned emission units.[629]

Companies with assigned emission units handle the cancellations of emission units themselves by transferring the emission units from a stock account (*"Bestandeskonto")* into a retirement account ("*Rückgabekonto"*). The national authorities check the retirement account to determine compliance of the committed companies.[630]

In accordance with the Kyoto regulation, the Registry-Ordinance asks following registry data deemed *"not particularly sensitive"* to be published

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626 The Kyoto Protocol requires the participants in the Kyoto market to have a National Registry responsible for ensuring the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and retirement of emission units.Eligibility to participate in the market-based mechanisms depends on compliance with the methodological and reporting requirements under Article 5, paragraphs 1 and 2 and Article 7, paragraphs 1 and 4 of the Kyoto Protocol. To have a National Registry in place is one of the six eligibility criteria as defined by the Marrakesh Accords.

627 Explanations to the Registry-Ordinance, 1. The Status of the national registries must be recorded according to a Standard Electronic Format (SEF). Decision 14/CMP.1; Decision 15/CMP.1 section I.E. The standard Status tables for each Party are publicly available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

628 Article 12, paragraph 4 of the CO_2-Fee-Ordinance.

629 Article 2 of the Registry-Ordinance.

630 Explanations concerning National Emissions Trading Registry, 2.

electronically:[631] A list of participants holding an account in the National Registry;[632] a list of accounts opened in the national registry;[633]an annual summary of quantity of emission units per type of operation made in the National Registry.[634]

Also CH-ETS specific information is or will be publicly available, among others: A list of installations in the CH-ETS; a compliance status of operators; a list of non-compliant installations. The total quantity of emission units in each account and the identity of sellers and buyers of emission units is considered to be confidential information and thus not publicly available.[635]

In collaboration with the FOEN, the Bernese Cantonal Bank (BEKB) has established a trading platform for *"Swiss Emission Units"* (CHUs). [636] The platform is ready for operation since November 2009. Every transaction performed over the BEKB-platform must be followed by the respective transaction in the National Registry.[637] So far, no transaction has been registered over the BEKB-platform. There are two reasons for this. Firstly, until 2010 companies included in the ETS had agreed on relative emission reduction targets that were based on production levels. This created uncertainties with regard to whether the company was short or long and, therefore, most companies decided to wait to sell emission units. Since 2010, the targets have been fixed. Secondly, ETS companies have been long over the past years by around 0.5 million tonnes per year according to recent figures from the Swiss Environment Ministry.[638]

631 Article 11 of the Registry-Ordinance, pursuant to paragraphs 45 and 48 of the annex to decision 13/CMP.1. See the menu item "*public reports*", available at <www.national-registry.ch>.

632 Paragraph 48, annex to decision 13/CMP.1.

633 Paragraph 45, annex to decision 13/CMP.1.

634 Paragraph 47, annex to decision 13/CMP.1.

635 According to Decision 13/CMP.1, paragraph 47, subparagraph a, d, f, l. See introductory site to <www.national-registry.ch>.

636 Available at <https://www.otc-x.ch/markt/instrument/valor/999999.html>, accessed on 14 November 2011.

637 The other option for trading in the CH-ETS is over-the-counter (OTC) trading. If and how many OTC-transactions have taken place so far is not known.

638 CLAASEN/ARNOLD, 56.

4.5.3 Temporal Flexibility

According to the Kyoto Protocol and its implementation modalities, the surplus ERUs, CERs and AAUs, may be carried forward into the subsequent commitment period for compliance purposes.[639] The forward transfer of emission units in time is referred to as *"banking"*, which means that an overfulfilment of the targets in the current commitment period can be carried over to subsequent commitment periods.[640] The opposite is referred to as *"borrowing"*: Emission units from a subsequent allocation year are placed in installation holding accounts for compliance purposes.

Swiss emission units which were not used in the first period 2008 to 2012 can be used in the subsequent period without restriction.[641] Borrowing is defacto also possible. Emission units were allocated for the entire period from 2008 to 2012, but compliance is to be established only after the end of the period.[642]

For the post 2012-period, the Draft CO_2-Act foresees maximal temporal flexibility. Emission units which were not used in the first period 2008 to 2012 can be used in the subsequent period without restrictions.[643]

4.5.4 The CO_2-Fee as an Instrument for Compliance

For Non ETS-companies, the CO_2-Fee currently constitutes a kind of a tax. For ETS-companies, on the contrary, the exemption from the CO_2-Fee is the key incentive to participate in the CH-ETS. At the same time, the CO_2-Fee is the central compliance instrument of the current CH-ETS.[644]

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639 Article 3, paragraph 13 of the Kyoto Protocol provides for the general carry-over. Paragraph 15, annex to decision 13/CMP.1 specifies the carry-over for ERUs, CERs and AAUs. The RMUs may not be carried-over. Paragraph 16, annex to decision 13/CMP.1.

640 While many trading systems allow banking, the EU-ETS is unique among cap-and-trade programs in allowing borrowing. However, there are several important limitations on banking and borrowing in the EU-ETS. The most important is that no inter-period banking or borrowing is allowed. TROTIGNON/ELLERMAN, 17.

641 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7475.

642 HAITES/MULLINS, 62.

643 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7475.

644 In the EU, the compliance instrument is a fine of a fixed sum per tCO_2e emitted in excess. Additional civil and criminal penalties, for example for fraudulent reporting, are

Article 13 of the CO_2-Fee-Ordinance foresees a reimbursement of the CO_2-Fee for tax-exempt companies on demand. The tax-exempt companies have to hand in a formal request for reimbursement containing a summary of the paid CO_2-Fee amount, the invoices thereof and detailed information on quantity and kind of the purchased fossil fuel.[645] The demand has to be handed in before 30 June of the following fiscal year.[646] A demand for reimbursement must amount to at least 100 CHF.[647] From each demand, 5 per cent are deducted for covering administration costs, 50 CHF minimal and 1'000 CHF maximal.[648]

Under actual legislation, a non-compliant company (compliance may also be achieved by compliance trading) has to pay back the redistributed CO_2-Fee inclusive interests to the Directorate General of Customs.[649] Compliance may also be achieved by compliance trading. The amount to be paid back in case of non-compliance shall be set by the Directorate General of Customs per Act of Disposal.[650] The payment must be settled within 60 days.[651] In case of delayed payment, an interest on arrears of 5 per cent has to be paid.[652]

With the currently discussed Draft CO_2-Act, participation in the CH-ETS and the CO_2-Fee as an instrument for compliance will be de-connected. The participating companies in the CH-ETS will still be CO_2-Fee exempt, but the sanction in case of non-compliance will be a fixed sum. The Draft CO_2-Act foresees a penalty of 160 CHF per tCO_2e in case of non-compliance with the Target Agreement.[653]

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left to Member States, under the condition that the relevant legal provisions are notified to the European Commission and that they are effective, proportionate, and dissuasive.

645 Article 13, paragraph 3 of the CO_2-Fee-Ordinance.

646 Article 14, paragraph 2 of the CO_2-Fee-Ordinance.

647 Article 15, paragraph 1 of the CO_2-Fee-Ordinance.

648 Article 15, paragraph 2 of the CO_2-Fee-Ordinance.

649 Article 19, paragraph 1 of the CO_2-Fee-Ordinance: *„Unternehmen, die ihre Verpflichtung nicht erfüllen, müssen die zurückerstatteten Abgaben samt Zinsen an die Oberzolldirektion zurückbezahlen."*

650 Article 19, paragraph 2 of the CO_2-Fee-Ordinance.

651 Article 19, paragraph 3 of the CO_2-Fee-Ordinance

652 Article 19, paragraph 4 of the CO_2-Fee-Ordinance

653 Article 18, paragraph 1 of the Draft CO_2-Act: *„Die ETS-Unternehmen müssen dem Bund für Emissionen, die weder durch Emissionsrechte noch, soweit zulässig, durch Emissionszertifikate gedeckt sind, einen Betrag von 160 Franken pro Tonne CO_2-Äquivalente (CO_2e) entrichten."* In the EU-ETS, the excess emissions penalty shall be

4.5.5 Non-Compliance with CO_2-Fee-Provision

According to the CO_2-Act, defraudation of the CO_2-Fee will be fined with an amount up to three times the unlawfully advantage.[654] Compromising the CO_2-Fee may be fined with an amount up to 100'000 CHF.[655] Pursuing and judging authority is the Federal Customs Administration.[656] The competence for regulation of imposition of sanctions behooves to the Federal Council.[657]

Article 13, paragraph 1 of the CO_2-Act disposes a fine up to 100'000 CHF for deliberate and negligent compromising of the CO_2-Fee, Article 13, paragraph 2 disposes a fine up to 30'000 CHF for heavy cases or relapses. The Draft CO_2-Act does not mention deliberate and negligent compromising of the CO_2-Fee and foresees a fine up to 30'000 CHF for heavy cases or relapses.[658]

4.6 Performance of the CH-ETS

On 19 November 2010, the FOEN published the emissions projections for the period 2008 to 2012. The total of the effected emissions in 2008 and 2009 were both above the respective Kyoto target.[659] For the whole commitment period of 2008 to 2012, FOEN projects, consequently, a yearly emission amount of up to 0.8 million tCO_2e above the committed target of

100 EUR for each tonne of CO_2e emitted for which the operator or aircraft operator has not surrendered emission units, increasing from 1 January 2013 onwards in accordance with the European index of consumer prices. Article 16, paragraphs 3 and 4 of the Consolidated ETS-Directive.

654 Article 12, paragraph 1 of the CO_2-Act; Article 38, paragraph 1 of the Draft CO_2-Act.

655 Article 13, paragraph 1 of the CO_2-Act disposes a fine up to 100'000 CHF for deliberate and negligent compromising of the CO_2-Fee, Article 13, paragraph 2 disposes a fine up to 30'000 CHF for heavy cases or relapses. The Draft CO_2-Act only disposes for a fine up to 30'000 CHF for heavy cases or relapses (Article 39, paragraph 2 of the Draft CO_2-Act).

656 Article 41, paragraph 2 of the Draft CO_2-Act.

657 Article 36, paragraph 3 of the Draft CO_2-Act.

658 Article 39, paragraph 2 of the Draft CO_2-Act.

659 See FOEN, "*Kräftiges Wirtschaftswachstum stellt Erreichung des Kyoto-Ziels in Frage*", available at <http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=de&msg-id=36308>. The tendancy has not changed since. See MARKUS HOFMANN, "*Auslagerung der Emissionen in Schwellenländer. Zwiespältige Bilanz der internationalen Klimapolitik*", in: Neue Zürcher Zeitung (NZZ), 11 November 2011, 15.

48.6 million tCO_2e per year, the effects of the Swiss forests as sinks and the effected purchase of emission units by the Climate Cent Foundation included.

The projected surplus of emissions cannot simply be declared to be a failure of the CH-ETS. Firstly, the CH-ETS covers only about 6 per cent of the total GHG emissions in Switzerland. Secondly, the entire industry sector in Switzerland has reduced emissions quite effectively. According to the monitoring data of ENAW, the some 2000 companies supported by the ENAW have registered a reduction of more than 1 million tCO_2e in 2009.[660] The projected surplus of emissions is a result of slow progress in limiting emissions from the building sector as well as a result of undamped increase of emissions in the transport sector.

As emission units generated according to the provisions of the Kyoto Protocol abroad may be purchased and transferred by private companies or, in parallel, by governments, it is now considered whether the Climate Cent Foundation may purchase CERs in such an amount as to cover the Swiss excess emissions in order to be in compliance with the committed reduction target for the ending Kyoto commitment period 2008 to 2012.[661]

4.7 Outlook on the Future of the CH-ETS

A Swiss Emission Trading Scheme exists. It is a system based on voluntary measures offering incentives for self-regulation, representing an element of a changing relation between state and individuals.[662]

But the Swiss Emission Trading Scheme exists (almost exclusively) on paper. The only known transactions realized so far are the emission units

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660 See ENAW, "*Schweizer Unternehmen reduzieren mehr als 1 Million Tonnen CO_2 pro Jahr*", available at <http://www.enaw.ch/medien/resultate/96-was-bringt-die-teilnahme-am-energie-modell-der-enaw->.

661 GIORGIO MÜLLER, *"Freiwilliger Klimaschutz in Gefahr"*, in: Neue Zürcher Zeitung (NZZ), 30 March 2011, 27.

662 HAUSER, 823. The EU-ETS, by contrast, is less self-regulated and more intensively controlled by Member States. HAUSER, 1285. On new models of governance and collaborative networks consisting of nation states and non-state actors in combating climate change see also CHARLOTTE STRECK, *"New Partnerships in Global Environmental Policy: The Clean Development Mechanism"*, in: Journal of Environment & Development, Volume 13, Number 3, September 2004, 295-322.

bought by the Climate Cent Foundation.[663] A carbon market with a true market price has not yet been established in Switzerland.

Of course, the current CH-ETS is a complicated result of a complex search for a political compromise.[664] As it was the case with the EU-ETS, the primary goal of a trial phase must be to develop the infrastructure and to provide the experience to enable the successful use of a cap-and-trade system to limit GHG emission in Switzerland during the next compliance period.[665] From this perspective, the CH-ETS is a success.

The Swiss Emission Trading Scheme is only a little piece in the puzzle of the comprehensive Swiss climate policy. This puzzle failed to prevent Switzerland from missing its reduction target. Estimations propose a likely desideratum of up to 0.8 million tCO_2 respectively both under the CO_2-Act as well as under the Kyoto Protocol.[666]

The missed reduction target is not the result of a lack of effectiveness of the CH-ETS. On the contrary, efforts of the EnAW working with ETS-companies and the efforts of the cement industry have resulted in a reduction of about 4 million tCO_2e yearly.[667] The surplus of emissions in Switzerland is due to a failure to act within the Non CH-ETS sectors, namely transport and, to a less dramatic extent, the building sector.

Emissions from transport continue to increase unhindered, the idleness in the legislation process concerning the transport sector undermines the confidence in the decisiveness of Switzerland to play a leading role in combating climate change on international level. As Hauser argues, a climate change policy based on incentives for voluntary measures must be based on credibility. The fact that Switzerland renounces from taking action to tag also the

663 In the EU-ETS, in contrast, a volume of 15-20 million tCO_2e is traded daily. About half of the transactions are realized over one of the four existing stock exchanges (ECX, Bluenext, Nordpool, EEX), the rest is traded over-the-counter (OTC). Ecoplan, 31.

664 Zumbach, 57, adding that legislation as a result of a democratic process, in particular in Switzerland, seldom ends up in perfect legislation.

665 Ellerman/Joskow, 45.

666 See FOEN, „*Erreichung der Reduktionsziele von Kyoto-Protokoll und CO_2-Gesetz*“, 19 November 2010, available at <http://www.bafu.admin.ch/klima/09570/09572/index.html?lang=de>.

667 Giorgio Müller, *“Freiwilliger Klimaschutz in Gefahr*”, in: Neue Zürcher Zeitung (NZZ), 30 March 2011, 27.

GHG emissions from transport with a carbon price undermines the credibility of its climate change policy.[668]

668 HAUSER, 824: *"Ein wirksamer Anreiz, die Ziele durch freiwillige Massnahmen zu erreichen, setzt voraus, dass die Konsequenz der Nichterreichung der gesetzten Ziele bekannt ist und als verbindlich betrachtet wird. Indem trotz offensichtlicher Nichterreichung des Reduktionsziels bei den Treibstoffen gerade in diesem Bereich auf die Einführung der CO_2-Abgabe verzichtet wurde, leidet die Glaubwürdigkeit solcher Anreize zur Selbstregulierung.*"

5 Linking Emission Trading Schemes

5.1 Introduction

In 2010, emission units of the EU-ETS, EUAs, accounted for 84 per cent of the global market value.[669] In order to further expand and strengthen the international carbon market, the European Commission envisions building a network of links between the EU-ETS and third country's cap-and-trade systems.[670]

As most studies will affirm, linking Emission Trading Schemes is possible even between quite different systems. A high degree of harmonization between connected markets may be desirable, but is by no means a necessity.[671] Successful, however, will it only be where a number of conditions is satisfied.[672] The most important feature is thereby the credibility and mutual confidence.[673]

Since its inception, the Swiss Emission Trading Scheme has been developed with the aim to be compatible to link up with the EU-ETS. Similarly, the EU-ETS was designed to be enlarged by linking to third country's Emission Trading Schemes. Serious hindrances to link the two Emission Trading Schemes are, hence, not to be expected.

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669 WORLD BANK, 2011, 9.

670 DAMIEN MEADOWS, *"The European Union's Approach to International Credits"*, in: WORLD BANK, 2011, 15.

671 MEHLING, 114.

672 MEHLING, 115, Table 5.1. Mandatorily compatible must be: (1) continuity of the scheme; (2) no ex-post adjustments; (3) absolute caps; (4) no price caps/safety valve. Desirable though not essentially compatible design features are: (1) covered sectors; (2) commitment periods; (3) fungibility of emission units; (4) environmental stringency; (5) possibility of banking emission units; (6) offset crediting; (7) enforcement rules. Optionally compatible design features are: (1) new entrants and closures; (2) allocation method; (3) leakage control mechanism; (4) monitoring and verification; (5) registries.

673 MACE ET AL., 51/52. The authors identify the same four essential design features as MEHLING but distinguish between the features of ex-post adjustments and unconstrained borrowing, which is essentially the same mechanism.

5.2 Linking in Theory

Linking occurs when a tradable emission unit system's regulatory authority allows regulated entities to use emission units from another system in order to meet compliance obligations.[674] However, recognition alone will not yet facilitate effective trading. For transactions to occur between linked schemes, a link also needs to allow the flow of emission units across schemes.

Yet, linking remains possible even when central design elements of the affected carbon markets differ.[675] Questions of compatibility ultimately reside in the political domain.[676]

5.2.1 Form of Linking

A link between carbon markets can assume various manifestations, with differences in degree, scope, and the direction of trading flows.[677] Emission Trading Schemes may be linked through a direct or through an indirect mechanism. The linkage may be multi-, bi- or unilateral.

5.2.1.1 Direct Linking

Direct linking means to allow regulated entities to directly purchase and use emission units from another trading scheme for their domestic compliance obligations.[678] Direct linking is the mutual recognition of allocated emission units in each domestic ETS for compliance purpose. The emission units from one ETS are fully fungible and valid in another country's ETS.[679] Direct links may be multi-, bi- or unilateral.

In the case of a full bilateral or multilateral link with freely traded emission units between two or more schemes, each scheme's emission units must be

674 JAFFE/RANSON/STAVINS, 791. The linkage of domestic tradable emission units systems is different from the state-to-state trading envisaged under Article 17 of the Kyoto Protocol, whereby signatories to the Protocol can trade their „*assigned amounts*".

675 MACE ET AL., 51.

676 MEHLING, 115.

677 MEHLING, 113.

678 STERK/MEHLING/TUERK, 23.

679 BAZELMANS, 305.

equally valid for compliance in the other scheme.[680] The current EU-ETS, for example, may be described as a system of 30 largely independent, but inter-linked national Emission Trading Schemes, which have agreed to make their emission units tradable within the EU-ETS while adhering to certain common EU rules, procedures, guidelines and criteria.[681]

In an unilateral link, system A can purchase and use emission units from system B for compliance but not vice versa.[682] This creates a one-way flow of emission units between Emission Trading Schemes, which can give the regulated domestic industry additional flexibility in locating cost-effective emission reduction opportunities.[683] Unilateral links are, therefore, sometimes also called one-way links. The best-known example of a one-way link is the CDM of the Kyoto carbon market.

Leakage may be considered as an unilateral and unintended de-facto linkage in the absence of formal linkage systems: Trade and movements in carbon-intensive activities flow from high to low price countries.[684]

5.2.1.2 Indirect Linking

An indirect link occurs when two schemes A and B are linked to another system C by a common acceptance of emission units generated under system C but not to each other.[685] There is no mutual acceptance of allocated emission units under each domestic ETS necessary, but only shared standards and acceptance of project-based emission units.[686]

As a result, the two indirectly linked systems will compete for emission units from the third system. This indirect linkage will reduce the difference between the two cap-and-trade system's emission units prices. If there is a sufficient supply of emission units at a price below the two cap-and-trade systems' pre-link emission unit prices, and if there are no constraints on the use of these emission units in either system, then prices in the three systems will converge.[687]

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680 STERK/MEHLING/TUERK, 23; SCHÜLE/STERK, 5; MEHLING, 119.
681 POHLMANN, 343; ELLERMAN/JOSKOW, 4.
682 STERK/MEHLING/TUERK, 23.
683 MACE ET AL., 76.
684 METCALF/WEISBACH, 23.
685 STERK/MEHLING/TUERK, 24.
686 BAZELMANS, 305.
687 JAFFE/RANSON/STAVINS, 798.

A scheme that establishes a multi-, bi- or unilateral link to another scheme also establishes indirect links with any other schemes to which the latter is linked.[688] Developments in one scheme will subsequently affect the supply and demand for emission units in each other scheme.[689]

An indirect link also occurs when bilateral or multilateral linkages are channelled through an intermediary. For example, markets may be linked via each country's governments under Article 17 of the Kyoto Protocol. Under such an approach, an entity in scheme A wanting to sell emission units to scheme B would hand the respective amount of emission units to its government. The government would convert these emission units into AAUs and transfer them to the government of scheme B. Government B would then convert these AAUs into its national emission units and issue them to the buyer.[690] In fact, most emerging Emission Trading Schemes will probably be indirectly linked through the Kyoto Protocol's CDM, because most systems plan to allow regulated entities the use of CERs.[691]

5.2.1.3 Institutional Considerations

Linking Emission Trading Schemes requires not only agreements on how the link will be designed but also how the environmental effectiveness of schemes to be linked can be sustained in the long term.[692] Therefore, the institutional set-up of a linkage needs careful considerations. As integration becomes more aligned with domestic political priorities, participating jurisdictions may be willing to consider more formal arrangements to promote further market integration.

Linking arrangements may range from a multilateral treaty fully integrating Parties into a single mandatory cap-and-trade scheme to loose cooperation between linked jurisdictions.[693] MEHLING describes five ways an understanding to create a link can be reached between different trading schemes: (1) through binding international agreements such as treaties; (2) through mutual recognition of emission units by way of reciprocal rules in the domestic law

688 MEHLING, 114, referring to MEHLING/HAITES, *"Mechanisms for Linking Emissions Trading Schemes*", in: Climate Policy, Volume 9, Number 9, 2009, 169-184.

689 MEHLING, 114.

690 SCHÜLE/STERK, 5.

691 STERK/MEHLING/TUERK, 24.

692 STERN, xxiii, advocates clear revision rules covering the basis for allocation in future trading periods in order to create greater predictability for investors.

693 MACE ET AL., 77; MEHLING, 122.

of participating jurisdictions; (3) through purely political arrangements; (4) through trans-boundary contracts entered into under private international law; and (5) through unilateral linkages. [694]

Most likely, a direct bi- or multilateral link will be formalized by an international treaty.[695] In a majority of cases, the adoption of international treaties – and especially multilateral treaties – also entails a cumbersome and often challenging ratification process. On the other hand, this approach would provide a high degree of legal certainty and transparency.[696] Likewise, a withdrawal from the treaty and subsequent amendments are subject to formal constraints implying that any provision for adjustment or suspension of the link should already be included in the treaty from the outset.[697] This way, changes to link will not necessitate full recourse to the formal procedures outlined above. Such a simplified process may also be extended to additional links with further partners, for instance through the inclusion of all recognized emission unit types in a schedule contained in an annex or protocol.[698]

A bilateral or multilateral link can also be created by way of a political understanding on the mutual recognition of emission units, coupled with domestic legislation adjusting each scheme. Such reciprocal links have the benefit of obviating lengthy ratification procedures.[699] Coordination between markets can be achieved through informal negotiations.

A mutual recognition agreement might establish a supranational mechanism to oversee the Parties' national decision-making, to establish the standards

694 MACE ET AL., 73, referring to MICHAEL MEHLING, *"Bridging the Trans-Atlantic Divide: Legal Aspects of a link between regional carbon markets in Europe and the United States,"* in: Sustainable Development Law and Policy, Winter 2007, 46.

695 MACE ET AL., 73. The Vienna Convention on the Law of Treaties, 23 May 1969, Article 2 paragraph 1(a), 8 I.L.M. 679, 1155 U.N.T.S. 331, defining a "treaty" as "*an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation"*. The term *"treaty"*, hence, is used to describe any form of agreement between two or more states or international organizations that creates legally binding rights and obligations for Parties and that is governed by international law in relation to its validity, application, interpretation and enforceability.

696 SCHÜLE/STERK, 5.

697 MEHLING, 121.

698 STERK/MEHLING/TUERK, 29, referring to MEHLING/ HAITES 2009.

699 MEHLING, 121.

and procedures for mutual recognition, to adjudicate the implementation of a regime, or to certify assessment bodies under the regime.[700]

An umbrella agreement harmonizing certain features of the domestic trading schemes and specifying mandatory procedures may also be used to create an institution with limited powers, such as a *"treaty secretariat"* or a *"clearinghouse facilitating trading*".[701]

Ultimately, a central institution mandated with broad governance functions may even assume powers similar to those presently exercised by central banks, including the creation of an emission unit reserve for strategic intervention in the supply.[702] Important functions of such a clearing house must also be to avoid reductions in the environmental effectiveness of linked schemes and to reassure all stakeholders that the schemes are and continue to be comparably stringent.[703]

Alternatively, governments may come to an informal agreement to amend their respective emission trading legislation. A formal way of documenting an agreement could be for example a joint political declaration or a memorandum of understanding.[704] An unilateral link can be established through inclusion of a clause in the architecture of each trading scheme, specifying the conditions for recognition of foreign emission units.[705] Because the clause establishing the link remains within the remit of national jurisdiction, the link can also be unilaterally altered or terminated at any point in time.

In the absence of a formal link, private market participants could use private law to bridge trading schemes by creating a system for the conversion of units. Regulated entities may enter into private agreements to swap emission units recognized in one system for those recognized in another. In fact, history has already provided an example of a swap between two private companies bridging the trading schemes of Denmark and the United Kingdom in 2002.[706] Individuals may also open *"personal holding accounts"* in the reg-

700 MACE ET AL., 80.
701 MEHLING, 122/123; SCHÜLE/STERK, ii.
702 MEHLING, 123/4.
703 SCHÜLE/STERK, ii.
704 SCHÜLE/STERK, 5.
705 MEHLING, 119.
706 SCHÜLE/STERK, 6.

istries, facilitating the trading of CERs, for example, between companies and individuals.[707]

However, linking arrangements based purely on administrative or technical regulations, without a corresponding mandate in formal law, thus risks being perceived as deficient in legitimacy.[708]

More important than the legal form may be the question whether the linking agreement and the framework of commitment are credible and enforceable.[709] A central authority such as a treaty secretariat or a clearing house could contribute to transparency and predictability. Due to the significant economic implication of linked Emission Trading Schemes, there is a need for certainty and transparency in the linking process. The more diverse the forms of linkages in place are, the less transparency governs the market.

Whether an agreement is about the linkage of two Emission Trading Schemes or whether an agreement creates a stand-alone trading structure, negotiators should focus on creating a framework of commitments that are credible and enforceable, rather than focus excessively on the legal form of those commitments.[710]

5.2.2 Linking the Coverage of Sectors and Gases

Differing sector or gas coverage is not a matter of institutional compatibility. An unequal coverage of sectors and gases does not create any hindrance for linking two trading schemes. As long as a linked trading scheme meets all other political and technical linking requirements, it does not affect the environmental effectiveness, either.[711]

In October 2007, at the occasion of the incorporation of the ETS-Directive into the EEA Agreement, the European Commission reminded of the minimal requirements for national or regional Emission Trading Schemes to join the EU's Emission Trading Scheme. Third country's Emission Trading

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707 MACE ET AL., 77.

708 MEHLING, 124. Evidence from other regimes suggests that states often take non-binding agreements quite seriously and make significant efforts to implement them. See BODANKSY, referring to DINAH SHELTON (ed), *"Commitment and Compliance: The Role of Non-Binding Norms in the International Legal System"*, Oxford, 2003.

709 TORNEY/FUJIWARA, 1.

710 TORNEY/FUJIWARA, 1.

711 MACE ET AL., 71.

Schemes must be mandatory, set absolute limits on emissions, have robust registry systems and stringent MRV- and compliance-provisions in place. [712]

However, differences in sectoral coverage may cause concerns regarding competitiveness if one scheme imposes emission constraints on sectors whose competitors are not covered in the other scheme. Such economic discrimination can be mitigated by economically efficient cap-setting. The economic impact would be the same as in an economy-wide Emission Trading Scheme covering all emitters.[713]

Differing sectors and gases may also raise questions regarding the necessary political support for linking under these circumstances. Therefore, a harmonization of coverage may be politically appropriate in the context of a linking agreement.

Competitive disadvantages and potential discrimination due to diverging treatment of sectors in two trading regimes, however, are not caused by linking and would also occur in its absence.[714]

5.2.3 Cap-Setting in a Linked ETS

The stringency of the cap is a design feature that leads to a significant transfer of wealth from the system with a stricter cap to the system with a more lenient cap.[715]

5.2.3.1 Absolute versus Relative Targets

In any Emission Trading Scheme, two types of reduction targets are conceivable: (1) absolute caps, which limit the total emissions during a specified period; and (2) relative targets, which are defined as emissions per unit of output or activity, such as gross domestic product or energy consumption per unit of input.[716]

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712 EU COMMISSION, *"Emissions trading: Commission announces linkage EU ETS with Norway, Iceland and Liechtenstein"*, Press Release of 26 October 2007, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1617>.

713 STERK/MEHLING/TUERK, 7.

714 MACE ET AL., 71; SCHÜLE/STERK, 11.

715 MACE ET AL., 60.

716 SCHÜLE/STERK, 3.

Relative targets require that allocation takes place in two steps. An initial allocation based on projected production levels is followed by an ex-post adjustment when the effective production levels are known.[717] This may lead to spikes in liquidity at the moment of adjustment and will also affect the scheme with absolute targets. Linking schemes that differ in the way the target is determined may thereby have a negative impact on the liquidity of the combined scheme. [718]

Linking schemes that differ in the way the target is determined may also have a negative impact on the environmental effectiveness. If participants in a relative program are able to sell emission units to participants in an absolute program, an increase in their output will generate more emission units and inflate the total quantity of emission units available to participants with absolute targets. The emission units can be sold to the absolute sector, thus providing an incentive to increase activity, which increases emissions.[719]

The linkage of a mandatory trading scheme with a voluntary trading scheme – the genuine element of which is not to have any cap because reduction efforts are voluntary – is likely to be infeasible due to concerns about relative levels of stringency.[720]

Given the political reality, a perfect balance of efforts is very unrealistic to be achieved across various reduction regimes. Competitive issues resulting from differing levels of stringency are reality. However, these differences are not a result of linking. They would also arise if the two schemes operate separately.[721]

5.2.3.2 Incentives to Cap-Setting Altered

When allocation is chosen by sovereign states, the possibility of trading will affect their allocation choices.[722] When an ETS is enlarged by a link to an-

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717 This was, in fact, the system in Switzerland until 2010. The freight aims were adjusted each year in relation to the company's production growth, with the final adjustment in 2010. Article 8, paragraph 2 of the CO_2-Fee-Ordinance and Enforcement Instruction of 2 July 2007, revised on 22 December 2009, 18.

718 SCHÜLE/STERK, 13, referring to V. CHOQUETTE, *"La création d'un pont entre le SEQEE et d'autres systèmes nationaux d'échanges de droits d'émission: Fondement théoriques, opportunités et implications"*, 31 May 2005, Bruxelles 2005, 6.

719 HAITES/MULLINS, 49.

720 MACE ET AL., 60.

721 STERK/MEHLING/TUERK, 15.

722 HELM, 2738. See also SCHÜLE/STERK, 13; HOLTSMARK/ SOMMERVOLL, 22

other ETS, a government can create additional value for its national entities by issuing additional emission units. The side effect is a damage to the environmental effectiveness of the combined scheme.[723]

JAFFE/RANSON/STAVINS remind that not all the governments would manage the tradeoff between additional value and environmental effectiveness in the same manner.[724] In an analysis using a game-theoretic approach, HELM concluded that in a linked scheme environmentally less concerned countries tend to choose more emission units if these are tradable, while environmentally more concerned countries choose less emission units.[725]

More specific results were presented by the study of HOLTSMARK/ SOMMERVOLL based on a model assuming a non-cooperative equilibrium. They found that trading will give small countries incentives for more generous allocations, while large countries will have a tendency to reduce their number of allocated emission units.[726] However, the smaller countries' incentives towards more generous allocations more than outweigh the larger countries incentives for tightening their allocations. The result is an overall increase of total allocated emission units.[727]

Despite this, a later study of CARBONE/HELM/RUTHERFORD using a calibrated general equilibrium model finds that agreements linking various Emission Trading Schemes can be effective. In addition, the study found that smaller groupings pairing developing and developed-world partners often perform better than agreements with larger rosters.[728]

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723 JAFFE/RANSON/STAVINS, 801.

724 JAFFE/RANSON/STAVINS, 804, referring to ROBERT KEOHANE/KAL RAUSTIALA, *"Toward a Post-Kyoto Climate Change Architecture: A Political Analysis"*, in: Harvard Project on International Climate Agreements, Discussion Paper 08-01, Prepared and Revised April 2009, 9, available at <http://belfercenter.ksg.harvard.edu/files/KeohaneFinalWebRevised4_09.pdf>.

725 HELM, 2738.

726 The reason for the small country's tendency to increase allocated emission units may be the relatively larger impact the linkage may have on small market participants than on large market participants. With allocation of a large number of emission units, governments of small countries aim at preventing a large flow of capital out of the country.

727 HOLTSMARK/SOMMERVOLL, 4.

728 CARBONE/HELM/RUTHERFORD, 2. According to the calculations, the most effective agreements shall be sub-global and involve countries with high environmental benefits and high abatement costs buying large volumes of emission permits from their developing-world partners (either China or members of the former Soviet Union. CARBONE/HELM/RUTHERFORD, 7. On the other side, their calculations also indicate that

5.2.4 Allocation in a Linked ETS

Differences in the way emission units are distributed to the companies within an ETS usually have no impact neither on the functioning of the combined ETS nor on the system's environmental effectiveness, since this is solely determined by the overall cap. However, there may be distributional effects since free allocation is a transfer of wealth, effectively a lump-sum subsidy.[729]

As various authors highlighted, linkage may alter the incentives that countries face with respect to allocation.[730] Governments may be tempted to issue more emission units in order to increase the value in the hands of its national companies on a linked market.

Indeed, the pilot period of the EU-ETS has demonstrated that linking itself changes the rules of the game. In linked trading schemes, participating states will have an incentive to relax their cap in order to become net sellers.[731] Member States were unable to resist the temptation to hand out generously emission units, causing the collapse of the price of the EUA at the end of 2006 and reducing to zero the incentives to abate emissions, to develop alternative fuels and more energy-efficient technologies.[732]

5.2.5 Definition and Recognition of Trading Units in a Linked ETS

Clear decisions on the nature and the treatment of emission units are important to give legal security and certainty to both governments and private entities. Difference in definitions and treatment of emission units can make one sub-market of the overall system more attractive than others. Different treatment can lead to distortions of the market.[733]

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coalitions (and global abatement) may benefit from excluding certain countries from membership. CARBONE/HELM/RUTHERFORD, 31.

729 STERK/MEHLING/TUERK, 16.

730 For example HELM 2737/2738; HOLTSMARK/SOMMERVOLL, 22. See also JAFFE/RANSON/STAVINS, 804; SCHÜLE/STERK, 13.

731 SCHÜLE/STERK, 13.

732 DE SÉPIBUS, Linking, 2008, 2.

733 WEMAERE/STRECK/CHAGAS, 36.

5.2.5.1 Differences in Offsetting Rules

By providing access to project-based offsetting for both ETS-covered energy-intensive and Non ETS-covered non-energy-intensive sectors, the CDM establishes an indirect link between the two sectors and assures full *"where-flexibility"*.[734]

If a particular type of emissions units, such as emission units from carbon sinks for example, is not recognized in one scheme, companies in another scheme accepting this emission unit could use them for domestic compliance purposes, thus freeing up *"regular"* domestic emission units and selling them to companies in the first scheme. The scheme's administrators would never be able to tell whether an incoming emission unit has perhaps been freed up by use of an external trading unit which they themselves would not accept for compliance.[735] The political decision in the first scheme about which emission units are recognized would thus be bypassed and emission units traded may reflect different kinds of underlying emission units or emission reductions some of which may not be considered politically acceptable for interchange (e.g. nuclear or large hydropower).[736]

A scheme with a more narrow recognition of emission units may take adjustment measures such as the introduction of exchange rates. This would increase transaction costs. Another possible means of accounting for emission units considered *"undesirable"* that are flowing into the other system would be to assess the share of such emission units in the total volume of emission units in the other system and discounting traded emission units from that system accordingly.[737]

The question would therefore probably rather be to which extent the negotiators of both countries would want to maintain their rules for the recognition of emission units instead of harmonizing them for the purpose of linking. If the inclusion of certain emission units is considered to be intolerable by a scheme with a more narrow recognition of emission units, the only option to really keep them out would be not to link to schemes which include them.[738]

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734 ANGER, 2046. Linking of Emission Trading Schemes in the absence of a post-Kyoto government trading would have considerably different economic consequences because no link and hence no permeability between ETS and Non-ETS sectors exists.

735 STERK/MEHLING/TUERK, 11.

736 MACE ET AL., 80; STERK/MEHLING/TUERK, 11.

737 STERK/MEHLING/TUERK, 11, Fn.6.

738 STERK/MEHLING/TUERK, 11; SCHÜLE/STERK, 12.

5.2.5.2 Quantitative Limits of Offsetting

Differences in quantitative limits of offsetting from abroad (the best known emission units are CERs) are not mutually compatible design features.

If one system prohibits the use of CERs and the other system allows the use of emission units for compliance purposes, more internal emission units will be freed to use in both systems. An emission unit of a particular type from abroad frees up a "*regular*" domestic emission unit. This can be accounted with an emission unit from a linked ETS regardless of the type of the original emission unit and thus increase the quantity of the emission units available in both schemes. The quantity of the emission units available of the lenient system will spill over turning the *"limited"* system to be lenient as well. (Figure 7)

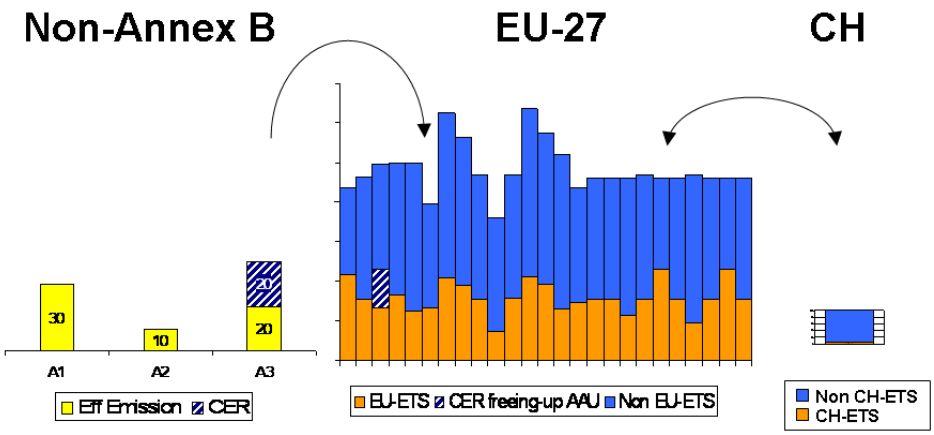

Figure 7: Offsetting from Abroad in a Linked CH-EU-ETS
An emission unit of a particular type from abroad frees up a *"regular"* domestic emission unit. This can be accounted with an emission unit from a linked ETS (for example Switzerland) regardless of the type of the original emission unit and thus increase the quantity of the emission units available in both schemes.

It may be possible to design mechanisms to avoid adverse outcomes if one system's entitlement to use CERs is much higher than the other's. For example, a mechanism disallowing transfers of CERs could be triggered if the percentage of offsets in a lenient system exceeds a certain level, preventing any further transfer of offsets from the lenient system into the limited system. Prices would then equilibrate separately – potentially shifting prices to

significantly different levels if there is a fundamental difference in abatement costs between the systems.[739]

While it is technically possible to link systems with different offset project crediting rules, differing rules can present political difficulties by rising concerns about environmental integrity and the proper role of other program goals.[740] A program with more lenient rules for additionality, for example, or with methodologies that result in significantly greater quantified emission reductions for the same types of projects, could in effect set the bar for environmental integrity for the entire linked trading system.[741]

As a remedy, WINTER suggests a reserve to be hold back by each Annex B-Party for the purchase and transfer of CERs. A private entity may invest into a CDM-project as it is the case in the current system, but the purchased CER would not add to the assigned amount but would have to be deducted from a special reserve fund each Annex B-Party has to set aside.[742]

5.2.6 Temporal Flexibility in a Linked ETS

5.2.6.1 Periods

Ideally, commitment periods of linked schemes are synchronized, or have long-term allocation trends which guide commitment period allocations.[743] Absolute consistency of periods is not necessary for institutional compatibility. Financial markets make it possible to buy emission units of various vintages from various program years in advance.[744]

Although problems raised by incompatible commitment periods look serious, they are largely a question of political confidence. It is possible to envision negotiations or confidence-building measures that overcome these problems.[745] Essential is, however, that the continuity of both schemes appears to be credible.[746]

739 MACE ET AL., 65/66.
740 MACE ET AL., 62.
741 MACE ET AL., 62.
742 WINTER, 296.
743 MACE ET AL., 61.
744 HAITES/MULLINS, 2001, 52-54.
745 MACE ET AL., 61.
746 MEHLING, 115; MACE ET AL., 59.

5.2.6.2 Banking

Differing banking rules are not an obstacle to linking but disparities in banking rules between linked schemes can create market distortions. If a scheme which prohibits banking is linked to a scheme which allows banking, the latter would effectively provide a banking option for all the participants in the combined market.[747] Entities in a scheme with more generous banking provisions could have a competitive advantage over entities in schemes with less generous rules.[748]

5.2.6.3 Borrowing

The linkage with a system that allows borrowing amplifies the risks and volatility of a combined ETS. The ability of participants in one system to borrow against periods without a fixed length, or periods for which allocations are as yet unknown, undermines present penalties for non-compliance - and undermine the stringency of the system to be linked. The lack of certainty would provide substantial pressure for lobbying on future allocations.[749]

Thus, linking a system without borrowing with a regime that allows borrowing may require restrictive provisions to be taken so as to maintain the environmental effectiveness of the linked trading scheme. Purchases from the scheme with borrowing must be restricted to the time after its compliance period has been completed. In addition, purchases may be allowed only from companies that did not borrow.[750]

5.2.6.4 Ex-Post Adjustments

Once caps have been set and allocations have been made, individual allocation decisions should not be altered (*"ex-post adjustments"*).[751] Technically speaking, ex-post adjustments correspond to the mechanism of borrowing and create additional opportunities for politically motivated market influence. Whereas regulatory certainty is an important prerequisite for the well-

747 STERK/MEHLING/TUERK, 18.
748 MACE ET AL., 61.
749 MACE ET AL., 56.
750 HAITES/MULLINS 2001, 62.
751 MACE ET AL., 58.

functioning of a market, ex-post adjustments *"run the risk of undermining the basis of a stable market upon which industry feels confident to invest*".[752]

There are exceptions of specific cases, for example in the case of the closure of an installation or in the case of a newly entering ETS-participant. Also, ex-post adjustments on a greater scale might be seen as a useful tool for controlling carbon price. If the market is deemed to be too liquid or prices are highly elevated, governments could reduce or increase the levels of emission units.[753]

5.2.7 Governance Issues and Intervention Mechanisms in a Linked ETS

Monitoring, reporting, verification and non-compliance penalties are likely to be a central concern in linking systems. Countries will have to be convinced that potential linkage partners have comparable enforcement regimes.[754] Only if the overall compliance mechanism of the system is perceived as credible, companies will be able to invest with confidence in a functioning market for emissions units with price signals representing a true level of scarcity.[755]

5.2.7.1 Monitoring, Reporting and Verification

Even within the EU Member States, monitoring, reporting and verification approaches are not identical though efforts are being made to better coordinate and harmonize the provisions. The European Commission has only limited instruments to control the application of the provisions of the ETS-Directive which is a matter of national bodies of the Member States. Therefore, serious doubts are raised about whether the enforcement mechanisms by national bodies of Member States are sufficient.[756] There is, for example, the issue with the verifiers. The Consolidated ETS-Directive makes clear that the verifier must be independent of the operator so that verification re-

752 MACE ET AL., 59, referring to M. GRUBB/K. NEUHOFF, *"Allocation and competitiveness in the EU emissions trading scheme: policy overview*", Faculty of Economics, Cambridge University, Earthscan, 2006.
753 MACE ET AL., 59.
754 METCALF/WEISBACH, 15.
755 MACE ET AL., 60.
756 EPINEY, 242.

sults are objective and unbiased under the EU-ETS. But in reality, the verifier is often a third party employed by the operator.[757]

The lack of full harmonization, therefore, is not a hindrance to linking. But the absence of a system that can be demonstrated to be of equivalent stringency would make linking impossible.[758]

5.2.7.2 Non-Compliance Penalty

Strong compliance mechanisms are essential for cap-and-trade systems. Any linked scheme must have clear mechanisms for ensuring compliance and quality throughout the entire system in order to ensure the quality of emission reductions, reporting efforts and the timely surrender of emission units.[759] While it is not necessary to have identically-specified non-compliance penalties between linked schemes, penalties must be comparable in magnitude and seen to be effective and robust.[760]

From the environmental perspective, the financial penalties for non-compliance should be significantly higher than the cost of emission units. If financial penalties for non-compliance with a cap-and-trade system are set lower than what would otherwise be the market clearing price for emission units, a similar effect is achieved. Lenient non-compliance penalties can function, in effect, as a kind of a price cap.[761] Stakeholders in a scheme with strict non-compliance provisions might also object to linking to a scheme with less stringent provisions.[762]

5.2.7.3 Cost-Containment Measures

Some Emission Trading Schemes may include a price cap to limit the costs of compliance to provide upper-bound cost certainty to regulated entities and prevent unexpectedly severe spikes in prices.[763] A so-called *"safety valve"* is an upper bound on prices in each period that is equal to a specified trigger

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757 MACE ET AL., 67. See also MICHAELOWA, 22/23, pointing out that as long as verifiers are mandated by the project developer themselves, the verifiers will be dependent on the project developers and will "*verify*" in their favour.

758 MACE ET AL., 67/68.

759 MACE ET AL., 67.

760 MACE ET AL., 67.

761 MACE ET AL., 52, Fn. 289.

762 ELLIS/ TIRPAK, 25; STERK/MEHLING/TUERK, 20.

763 MACE ET AL., 52.

price.[764] With this mechanism, the regulator commits to selling emission units at a pre-determined price in whatever quantity is demanded once the market price for emission units rises above a certain level. This mechanism limits the cost of the market participants to the safety-valve level.[765]

If a system with strict penalties such as the EU-ETS was linked to a system with a price cap or safety valve, the price cap would effectively act as a price cap for the combined system.[766] As long as the market price was higher than the price cap or safety valve level, companies in the price cap system would have an incentive to sell their emission units to companies in the other system until prices were equalized at the price cap.

Also, a one-way linkage can decrease the price of emission units in the system that establishes the link. One-way linkages will therefore lead to the propagation of cost-containment measures.[767]

Unless special provisions are taken to ensure that the environmental effectiveness is not affected, total emissions would be higher in the combined system than if the two schemes were kept separate.[768]

5.3 Economic Consequences of a Linkage

The consequences of emission trading under the Kyoto Protocol and the extended trading through linking are subject to numerous economical analyses. But the quantification of the implications of future policies has to be used with caution as the overlapping of international, regional and national climate policies make predictions very difficult.

When quantifying economic implications of a linkage, an important distinction between presence and absence of a post-Kyoto government trading must be made. The existence or non-existence of a post-Kyoto commitment period will have considerable implications on the interdependency between sectors covered by an Emission Trading Scheme and sectors not covered by an Emission Trading Scheme.

764 KRUGER/OATES/PIZER, 120.
765 STERK/MEHLING/TUERK, 20.
766 MACE ET AL., 53; KRUGER/OATES/PIZER, 120/121.
767 JAFFE/RANSON/STAVINS, 801/802.
768 ELLIS/TIRPAK, 26; STERK/MEHLING/TUERK, 20.

In the absence of an international project-based mechanism such as the CDM, the linking of two domestic Emission Trading Schemes allows flexibility only within the ETS-sectors which are, in the case of the EU-ETS, energy-intensive industries provided with generous initial emission units. The major compliance burden is, consequently, carried by sectors excluded from the linked Emission Trading Scheme. These non-trading segments are not able to benefit from a linked and thus enlarged Emission Trading Scheme.[769]

In the presence of an international project-based mechanism such as the CDM, access to project-based offsetting is provided for both ETS- and Non ETS-sectors. The CDM, thus, establishes an indirect link between the ETS- and the Non ETS-sectors and assures a certain flexibility. Due to the provisions of an international credit pool for all sectors, the CDM has the potential to level out economic impacts.[770]

5.3.1 Cost Effectiveness and Efficiency

In theory, linking distinct Emission Trading Schemes will increase efficiency by taking advantage of the diversity of sources. The diversity of sources entails a diversity of costs for emission reduction actions in the larger linked system, thus reducing the overall abatement costs and delivering a common environmental goal at least-cost.[771] This theoretical mechanism is indeed the starting point of the EU-Commission's efforts to enlarge the coverage of the Emission Trading Scheme. The Commission believes that new and additional abatement opportunities offer a high abatement potential and lower abatement costs. Lower abatement costs would ultimately lead to lower emission unit prices and would thus render the system more efficient.[772] It has been suggested that compliance costs could potentially be reduced by up to 30 to 40 per cent through the inclusion of new sectors and gases provided, however, that certain conditions are met including accurate monitoring, re-

769 ANGER, 2046.

770 ANGER, 2046.

771 BARON/PHILIBERT, 123; ELLIS/TIRPAK, 9; HAITES/MULLINS, 1; KRUGER/OATES/PIZER, 119. Transactional costs and administrative expenses in an ETS, however, are significantly higher than in a command-and-control system. WINTER, 297.

772 EUROPEAN COMMISSION, "*Impact Assessment"*, 32.

porting and verification.[773] Indeed, there are quantifications for a post-Kyoto climate policy assuming a policy scenario in line with current EU objectives concluding that a global carbon market with trade across all countries and sectors would halve the abatement costs compared with the no-trade case.[774]

This, however, is only the case if a post-Kyoto agreement is in place and if trade is possible across all sectors. In the absence of such an agreement, linking the EU-ETS induces no or only marginal economic benefits for the EU.

In the absence of such an agreement, the results of quantifications by ANGER suggest that linking the EU-ETS to other domestic schemes will not decrease total EU compliance costs by more than one per cent. As ETS trading exclusively covers energy-intensive sectors, only these industries would benefit from an enlarged trading scheme. The essential part of the economic burden is carried by non-trading sectors and cannot be reduced by linking Emission Trading Schemes.[775]

Also FLACHSLAND/MARSCHINSKI/EDENHOFER question the conventional gains-from-trade rationale and warn that the economic benefits of linking are not as clear-cut as they may seem.[776] As a principal objection to conventional gains-from-trade analyses, they suspect that the implicit assumption of a *"first-best world*", for example one without marked imperfections such as distorting taxes or externalities, leads to an overly optimistic and misleadingly clear-cut view on linking. The *"theory of the second-best"* states that optimal conditions hold in a first-best world may no longer be valid in a second-best world.[777] In the specific case of climate change, a driver for imperfection and inconsistency is time. Decision makers are driven by the

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773 EUROPEAN COMMISSION, "*Impact Assessment"*, 32, referring to the Final Report of the 1st meeting of the ECCP working group on emissions trading on the review of the EU-ETS on the scope of the Directive.

774 FLACHSLAND/MARSCHINSKI/EDENHOFER, *"To link or not to link: Benefits and disadvantages of linking cap-and-trade systems"*, in: Flachsland, Dissertation, 2010, 53, referring to P. RUSS/J.-C. CISCAR/B. SAVEYN/A. SORIA/I. SZÀBÒ/T. VAN IERLAND/D. VAN REGEMORTER/R. VIRDIS, *"Economic Assessment of Post-2012 Global Climate Policies: Analysis of Greenhouse Gas Emission Reduction Scenarios with the POLES and GEM-E3 Models"*, EU Commission Joint Research Centre Report, 2009.

775 ANGER, 2040.

776 FLACHSLAND/MARSCHINSKI/EDENHOFER, *"To link or not to link: Benefits and disadvantages of linking cap-and-trade systems"*, in: Flachsland, Dissertation, 2010, 52.

777 BABIKER/REILLY/VIGUIER, 35-37, referring to the general theory of second best of R.G. LIPSEY/K.LANCASTER, „*The General Theory of Second Best*", in: The Review of Economic Studies, Volume 24, Number 1, 1956, 11-32.

statements of the IPCC which produces pressure to act.[778] In addition, international climate change negotiations are highly politicised because enormous economic interests are at stake. Agreements on climate change, hence, always reflect a political optimum instead of a rational maximum.

The assumption of a second-best world was the starting point of calculations by HOLTSMARK/SOMMERVOLL. Based on a model of non-cooperative equilibrium, they found that effectiveness was reduced through linking of national emission unit markets.[779] HOLTSMARK/SOMMERVOLL concluded that linking national emission unit markets may turn out to be less important than was concluded in earlier studies. The explanation for these differing views may be that the earlier studies ignored how the linkage of emission unit markets would influence the governments' incentives to revise their respective allocations.[780]

Also BABIKER/REILLY/VIGUIER find that the conditions under which international emission trading is introduced diverge from the standard environmental economic textbook analyses in several important ways. Analysing the impacts on a nation or on a region, they find that impacts are particularly seriously diverging where economies deviate from the idealized perfect competitive economies.[781]

5.3.2 Increasing Liquidity - Decreasing Volatility

Increasing size and liquidity of carbon markets are often listed as potential benefits of linking.[782] Larger and thus more liquid carbon markets also reduce volatility providing higher predictability and certainty for market participants.[783] If this may be true observed from a mid- to long-term perspective, reality looks different from a short-term perspective.

As the result of a linkage, any difference between the systems' emission unit prices will lead to sales of emission units from the lower price system to the higher price system until the systems' emission unit prices converge at an

778 ZUMBACH, 57.
779 HOLTSMARK/SOMMERVOLL, 4.
780 HOLTSMARK/SOMMERVOLL, 5.
781 BABIKER/REILLY/VIGUIER, 34.
782 ELLIS/TIRPAK, 8, referring to HAITES/MULLINS; BARON/BYGRAVE ; BLYTH/BOSI.
783 ECOPLAN, 4.

intermediate level.[784] Small schemes with lower prices that link to the large EU-ETS may see their carbon price increase significantly.[785] Small Emission Trading Schemes with high prices that link to the EU-ETS may see their carbon price drop significantly. Any corresponding increase or decrease in emission unit prices in the EU-ETS is likely to be very small because of the dominance in terms of volume of the EU-ETS. Volatility – at least in the EU-ETS – must, consequently, be combated by other means than linking.

5.3.3 Prevention against Competitive Distortions

Opponents of the concept of emission trading may argue that the requirement to cover effected emissions with the equivalent amount of emission units constitutes a burden on ETS-participants and may trigger competitive distortion. The uneven financial burden due to the carbon price will lead to *"structural adjustments"* and, eventually, to carbon leakage. Due to this argument, the European industry managed to receive generous allocations of emission units for free.

Proponents of emission trading advocate for the linkage as a prevention against competitive distortions. A linkage of two ETSs and the enlargement of the market would contribute to alleviating competitive distortion between participants of one ETS and participants of the other ETS. Linked trading schemes would result in fewer competitive distortions for participants and reduce the threat of carbon leakage.[786]

Linking Emission Trading Schemes brings along various causes for competitive distortions such as unfair allocation methods, differing MRV-provisions and non-compliance penalties or asymmetric accounting methods. The most serious distortion, however, exists between trading sectors and non-trading sectors.[787] Generous emission allocation to the benefitting EU-ETS compa-

784 JAFFE/RANSON/STAVINS, 797.

785 ELLIS/TIRPAK, 24.

786 FLACHSLAND, Dissertation, 7; ECOPLAN, 4.

787 A study conducted by ECOPLAN in 2010 concluded that the marginal abatement costs in the EU-ETS currently amount to 16 CHF/tCO_2e, in the Non EU-ETS to 82 CHF/tCO_2e. This difference is due to a (relatively) modest reduction requirement distributed on (relatively) numerous emitters in the EU-ETS. Or expressed differently: As the reduction aim in the (relatively) large EU-ETS is small (due to generously allocated emission units), the reduction aim for the (relatively) small Non EU-ETS segment is high. In Switzerland, the divergence between marginal abatement costs in the ETS and outside the ETS is even more serious. The ECOPLAN-study concluded that marginal abatement costs in

nies cause a high reduction burden on Non EU-ETS segments which are excluded from the trading scheme.[788] Considering their high marginal abatement costs, these sectors account for almost the entire economic burden of the reduction commitment (*"sectoral burden shifting"*) and cannot be reduced by linking.[789]

Linking may, however, reduce competitive distortion arising from uncertainty. Many studies indicate that uncertainty will reduce the efficiency of climate policy.[790] Even worse so, small and frequent revisions of an emission cap will result in higher cumulative emissions than if policies are altered less frequently but more drastically.[791] Linking may, hence, contribute to promoting planning reliability, and thus reduce competitive distortion arising from uncertainty.[792]

5.3.4 Distributional Implications

While linking may result in an overall reduction of costs, it does not mean that everyone is better off.[793] Despite possible overall cost savings due to linking some participants of each of the linked programs are likely to be

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the CH-ETS currently amount to 30 CHF/tCO_2e, in the Non CH-ETS to 283 CHF/tCO_2e. See ECOPLAN, 20/21.

788 BORLAT, 1287, referring to various commentators who contest the efficiency of the dual system ETS versus Non-ETS.

789 ANGER, 2040.

790 WRÅKE, 17, referring to models of Robert MCDONALD/DANIEL SIEGEL, *"The Value of Waiting to Invest"*, in: The Quarterly Journal of Economics, Volume 101, Number 4, November 1986, 707-728; AVINASH K. DIXIT/ROBERT S. PINDYCK, *"Investment under Uncertainty"*, 1994.

791 WRÅKE, 17, referring to a study of SABINE FUSS/J.A. JOHANSSON/J. SZOLGAYOVA/M. OBERSTEINER, *"Impact of climate policy uncertainty on the adoption of electricity generating technologies"*, in: Energy Policy, Volume 37, Number 2, February 2009, 733-743.

792 ECOPLAN, 4: *"Ein Haupteffekt der Verknüpfung ist also, dass die Schweizer Unternehmen bei einer Verknüpfung mit dem EU ETS weniger Unsicherheiten in Bezug auf den künftigen CO_2-Preis haben. In diesem Sinne bringt die Verknüpfung des CH ETS mit dem EU ETS mehr Planungssicherheit für Schweizer Unternehmen."*

793 A comprehensive discussion is given by BABIKER/REILLY/VIGUIER; See also KRUGER/OATES/PIZER, 120.

financially disadvantaged as a result.[794] What may be beneficial to individual trading entities may not result in a net benefit for the country.[795]

In an early study conducted before the start of the EU-ETS and based on a model with multilateral externalities, HELM analyzed environmental and welfare effects of international emission trading. HELM concluded that potential emission unit buyers are the most likely candidates to suffer from a large negative strategic effect and, therefore, are to be worse off with trading.[796]

Whether net buyers are winners or losers depends also on the pre-link emission unit price. While net sellers in a domestic Emission Trading Scheme with low emission unit prices will benefit from a linkage to a scheme where the price for an emission unit is higher, the opposite is true for buyers in the first scheme. At the same time, net buyers in the high-price scheme win from linking, whereas sellers in such a scheme lose.[797]

The pre-link emission unit price depends, on the one hand, on the stringency of the cap. Linking different Emission Trading Schemes can have distributional impacts if entities within a sector in one ETS are treated more stringently or leniently than their competitors in a different ETS.[798]

The pre-link emission unit price depends, on the other hand, on the options for emission reductions available. The smaller the pool of reduction options gets, the more expensive the reduction options tend to be. The reason behind the phenomenon is that early reduction measures are relatively cheap because there is a large pool of reduction options and the least-costly reduction options may be picked out first.[799] In such a situation, a linkage offers a fresh pool of least-cheapest reduction options to be picked out.

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794 HAITES/MULLINS, iv.

795 BABIKER/REILLY/VIGUIER, 34.

796 HELM, 2745. At the danger of overstretching the conclusion of the analysis, HELM speculates that this may even prove a possible explanation as to why the USA has refused to ratify the Kyoto Protocol.

797 SCHÜLE/STERK, 2, Fn.2; STERK/MEHLING/TUERK, 2, Fn. 3; see also METCALF/WEISBACH, 7.

798 ELLIS/TIRPAK, 29.

799 In the context of the Clean Development Mechanism, the phenomenon is known as *„low-hanging-fruits“*.

5.3.5 National Concerns

Linking two Emission Trading Schemes may cause national concerns of governments promoting the tendency to alter their cap-setting.[800] This was observed in phase I and II of the EU-ETS when the allocation system pushed Member States to over-allocate emission units to in-state firms providing them an opportunity to become net sellers to the carbon market.[801] The allocations for phase II were negotiated against the realization that there was a great deal at stake, with phase I having shown the huge financial value of emission units, potentially more than 200 billion EUR in total over the five years of phase II.[802] Not surprisingly, governments were subject to enormous lobbying pressures.

The creation of linkages, therefore, may lead to a substantial flow of capital across national borders, influencing the balance of payments of participating states.[803] The greater the difference in (pre-link) emission unit prices is, the greater the inter-system capital flows becomes. A government may not agree to such a considerable capital flow to foreign countries by letting national companies purchasing (cheaper) emission units from foreign ETS-participants in a linked market.

A research of STERK/MEHLING/TUERK revealed that linking the EU-ETS to a system with far-reaching cost-containment measures such as the Lieberman-Warner bill[804] in the USA would lead to significant net purchases by the EU and a net transfer of wealth, occurring not due to economic activity but solely as a result of US regulation. Through linking, the EU would therefore effectively cede control over its emission unit prices (and the effect of the price signal on emissions) to the USA, a prospect that *"would hardly have been palatable"* to the EU.[805]

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800 HOLTSMARK/SOMMERVOLL, 22; HELM, 2737/2738; SCHÜLE/STERK, 13; FLACHSLAND/MARSCHINSKI/EDENHOFER, *"To link or not to link: Benefits and disadvantages of linking cap-and-trade systems"*, in: Flachsland, Dissertation, 2010, 54.

801 DE SÉPIBUS, Linking, 2008, 2.

802 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12.

803 KRUGER/OATES/PIZER, 119; MEHLING, 110.

804 On 18 October 2007, Senator Joseph Lieberman and Senator John Warner introduced America's Climate Security Act, also known as the Lieberman-Warner bill, intended to reduce the amount of GHG emissions in the USA by creating a national cap-and-trade scheme. On 6 June 2008, the Act was defeated by Senate Republicans over worries that it would damage the economy.

805 STERK/MEHLING/TUERK , 3.

There are secondary benefits associated with emission abatement which include reduced local air pollution, increased energy security due to reduced dependency from fossil fuel imports, encouragement of research and development and the general economic stimulus that goes along with low-carbon investments. If linking leads to a substantial outsourcing of abatement to other regions, these co-benefits – (which are not internalized in the emission unit price) will be lost.[806] Instead of a flow of capital to foreign countries, national governments may rather want to promote internal investments to promote these secondary benefits.

In addition, the linkage of Emission Trading Schemes may lower the incentive for stringent national caps for domestic economical reasons. A stringent cap induces high abatement costs. With a high price of emission units in a non-linked domestic market, there is a strong incentive for technical measures to reduce emissions. These costs are, seen from another perspective, investments into the domestic market promoting research and development and creating job opportunities and wealth. For instance, a price cap helps to confine abatement costs, but may compromise the stimulation of technological change. If, and at what level, the price cap will eventually be set becomes a question of which of the two involved policy goals prevails.[807]

The analysis of BABIKER/REILLY/VIGUIER shows that international emission trading can even be welfare decreasing because of general equilibrium effects when there are distortions. It occurs in countries exporting emission units when efficiency costs associated with pre-existing distorting taxes are larger than the primary gains from emission trading.[808]

The risk of large scale emission trading to be welfare decreasing in some cases seems not to have been generally appreciated in the environmental economics literature so far.[809] To the author of this thesis, however, the risks of missing domestic policy goals such as preserving environmental integrity and, at the same time, balancing national welfare at a reasonable level, appears to be considerably high, especially in the case of Switzerland as will be seen in the following sections. In addition, a linkage raises the question of whether the increased flexibility entails other risks such as, for example, a

806 FLACHSLAND/MARSCHINSKI/EDENHOFER, *"To link or not to link: Benefits and disadvantages of linking cap-and-trade systems"*, in: Flachsland, Dissertation, 2010, 55.

807 FLACHSLAND/MARSCHINSKI/EDENHOFER, *"To link or not to link: Benefits and disadvantages of linking cap-and-trade systems"*, in: Flachsland, Dissertation, 2010, 58.

808 BABIKER/REILLY/VIGUIER, 53.

809 BABIKER/REILLY/VIGUIER, 34.

loss of legitimacy and accountability.[810] As long as serious doubts exist as to whether emission trading is effectively contributing to net emission reductions, it can be argued that emission trading does not contribute to the constitutional requirements of preserving the health of the population and of preserving natural resources.

5.3.6 Impact on Total Global Emissions

The environmental benefits of emission trading are, consequently, highly dependent on the design of the trading system. Most importantly, the amount of emission reductions achieved by cap-and-trade stems not from the trading as such, but from the stringency of the cap.[811] Real-live Emission Trading Schemes will not necessarily be environmentally effective and may lead to higher emissions. This has been suspected already in the early 1990ies.[812]

By virtue of the flexibility afforded to participants, combined Emission Trading Schemes may even be more detrimental to environmental integrity. Linking Emission Trading Schemes will perpetuate certain features throughout the linked market. Price ceilings, generous offset provisions, and weak enforcement rules may lead to fewer emissions reductions than emission reductions in aggregate if each had operated separately.[813]

Summing up, altered incentives for cap-setting, questions of competitive distortions, distributional implications and (legitimate) national concerns end up in making reality *"second best"*. Fears that the complexity of linked Emission Trading Schemes leads to more global emissions must be considered seriously.

5.4 Issues in the Case of a CH-EU-ETS Linkage

Since its inception, the Swiss Emission Trading Scheme has been developed with the aim to be compatible to link up with the EU-ETS. Similarly, the

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810 MEHLING, 110.

811 STERK/MEHLING/TUERK, in: Climate Strategy, April 2009, 3.

812 HELM, 2738, referring to PETER BOHM, *"Distributional implication of allowing international trade in CO_2 emission quotas"*, in: The World Economy Volume 15, Number 1, January 1992, 107-114.

813 MEHLING, 110.

EU-ETS was designed to be enlarged by linking to third country's Emission Trading Schemes. Therefore, the key design features are expected to be generally compatible and do, as it is expected, not pose any hindrance to a linkage of the CH-ETS with the EU-ETS.

However, there are a few issues that deserve to be closely looked at, namely sectors and entities covered, the issue of aviation, the volume of the two Emission Trading Schemes, the prices, the quantitative limits of offsetting and some governance issues.

5.4.1 Linking in Practice

5.4.1.1 Mandate for Negotiation

In the Climate Policy after 2012-Dispatch, the Federal Council expressed clearly that the revised CO_2-Act ought to be compatible with the respective provisions in the EU in order to enable a link of the two Emission Trading Schemes.[814] While the Draft CO_2-Act, the legal basis for the CH-ETS, is still being revised, the Federal Council issued a formal mandate to take up negotiation with the European Union on 16 December 2009.[815]

One year later, on 20 December 2010, the EU-Council authorized the EU-Commission to open negotiation with the Swiss Confederation for a link between the two Emission Trading Schemes.[816]

5.4.1.2 Conclusion of an International Treaty

The Climate Policy after 2012-Dispatch of 26 August 2009 declares that a linkage of the CH-ETS to the EU-ETS shall be put in practice by a multilateral treaty.[817] In order to simplify the process, the CO_2-Draft delegates the competence to conclude an international treaty with the European Union on

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814 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7474. *"Angestrebt wird ausserdem die Kompatibilität mit dem EG-Emissionshandelssystem (EG-ETS), um eine Verknüpfung der Systeme zu ermöglichen.*".

815 See FOEN, "*Bundesrat erteilt Verhandlungsmandat für Verknüpfung mit EU-Emissionshandel*", available at <http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=de&msg-id=30717>.

816 See <http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/envir/118632.pdf>.

817 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7461.

the linkage of the two Emission Trading Schemes to the Federal Council.[818] If, due to the negotiated linkage treaty, a change to the law is required, the Federal Council's competence to conclude this international treaty will be dropped.[819]

In the European Union, a link of the EU-ETS to the CH-ETS must be approved by both the European Parliament and the Council deciding with a qualified majority.[820] Due to shared competences between the European Community and its Member States, the link would probably be adopted as a mixed agreement to which both the Community and the Member States are Parties. [821]

5.4.1.3 Next Steps

Differences between the Council of States and the National Council have inhibited to conclude the Draft CO_2-Act so far. A so-called *"difference settlement procedure*" ("*Differenzbereinigungsverfahren*") is inevitable causing delay in the domestic legislative process as well as in the international negotiations with the EU. The deadline to agree on the Draft CO_2-Act in Swiss Parliament has been extended to 29 August 2012.[822]

As there is not legal basis for a linkage under the current legislation, the negotiations with the EU are unlikely to be formally finalized before August 2012. The provisions for a linked CH-EU-ETS would then have to be im-

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818 Article 42 of the Draft CO_2-Act.

819 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7516.

820 COUNCIL OF THE EUROPEAN UNION, "*EU to link its greenhouse gas emissions trading system with Switzerland*", Press Release "*EU to link its greenhouse gas emissions trading system with Switzerland*" of 20 December 2010, available at <http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/envir/118632.pdf>. See also MEHLING, 132, referring to T. DELREUX, *„The European Union in International Environmental Negotiations: Legal Perspective on the Internal Decision-Making Process"*, in: International Environmental Agreements: Politics, Law and Economics, Volume 6, Number 3, 2006, 231-248, 236; D. THIEME, *"European Community External Relations in the Field of the Environment"*, in: European Environmental Law Review, Volume 10, Number 8/9, 2001 252- 264, 255.

821 STERK/MEHLING/TUERK, 27.

822 According to the Decision of the Council of State of 1 June, available at <http://www.parlament.ch/ab/frameset/d/n/4819/356078/d_n_4819_356078_356079.htm> and to the Decision of the National Council of 8 June 2011, available at <http://www.parlament.ch/ab/frameset/d/n/4819/356078/d_n_4819_356078_356079.htm>.

plemented very efficiently in order to be ready on time for the start of a new commitment period as of 2013.

In the meantime, negotiations between the EU and Switzerland on the linkage of their respective Emission Trading Schemes are ongoing.

5.4.2 Sectors and Entities Covered

The most obvious difference of coverage in a linked CH-EU-ETS concerns the size of the entities. The EU-ETS covers installations with more than 25'000 tCO_2e per entity. EU-installations with less than 25'000 tCO_2e emissions may be excluded from the EU-ETS.[823]

In Switzerland, a participation in the CH-ETS will be mandatory for companies with yearly emissions of more than 10'000 tCO_2e from specific sectors.[824] The authors of a study conducted by FIRST CLIMATE/ECONABILITY estimate that according to these provisions of the Draft CO_2-Act, some 43 companies will have to participate in the CH-ETS on a mandatory basis.[825] Voluntary may be the participation for energy-intensive companies with more than 5'000 tCO_2e yearly emissions.[826]

The considerable difference in size is likely to have consequences on transaction costs faced by participating entities. As the EU-Commission stated in its *"Impact Assessment"* of 2008, the cost-benefit ratio for including small emitters appears unbalanced. Therefore, Article 27 was introduced into the ETS-Directive enabling Member States to exclude installations from the EU-ETS which have reported emissions of less than 25'000 tCO_2e and, where they carry out combustion activities, have a related thermal input below 35

823 Article 27 of the Consolidated ETS-Directive.

824 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7474, spells out the limit of 10'000 tCO_2e. It is not mentioned in the Draft CO_2-Act. Sectors: Power supply (e.g. combined heat and power plant, cogeneration plant for heat and power), coking plant and petroleum processing (e.g. refineries), metal production and machining (e.g. raw iron and steel), production of metal produces, production of glass, glassware, ceramic, manufacturing of stones and earths (e.g. cement, lime and bricks), manufacturing of cellulose, pulp and paper, manufacturing of chemical produces and refuse incineration plants.

825 FIRST CLIMATE/ECONABILITY, 57.

826 FEDERAL COUNCIL, Climate Policy after 2012-Dispatch, 7474, spells out the limit of 5'000 tCO_2e. It is not mentioned in the Draft CO_2-Act.

megawatt *("opting-out")*.[827] In addition, Member States may allow simplified monitoring, reporting and verification measures for installations with average annual verified emissions which are below 5'000 tonnes a year.[828]

Different are also the definitions of an installation. Under the ETS-Directive, installations with various production sites would be split up into individual installations. The consequence is that the list of covered Swiss entities in a linked CH-EU-ETS shows a remarkably more elevated number of small emitters compared to the current regime.[829]

In theory, the difference in coverage between the EU-ETS and the CH-ETS is not an obstacle to linking. It may, however, raise concerns regarding competitive disadvantages if the small installations in Switzerland have to bear comparably high transaction costs whereas large installations in the EU profit from comparably low transaction costs due to higher quantity of emission units available.

5.4.3 The Particular Issue of Aviation

The Aviation-Directive of the European Union has its implications on Switzerland regardless of a linkage of the CH-ETS with the EU-ETS.[830] Either Swiss carriers arriving to or departing from an aerodrome situated in the territory of an EU-Member State must comply with the provisions of the EU-ETS in the aviation sector. Or Switzerland must adopt adequate measure for reducing the climate change impact of these flights deemed to be sufficient by the EU-Commission and the Member States.[831]

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827 Article 27, paragraph 1 of the Consolidated ETS-Directive. However, the Commission made clear that an exclusion of small emitters from the EU-ETS on the grounds of cost-effectiveness cannot mean that these installations do not need to contribute to the overall emission reduction targets of the EU. The Commissions highlights the need to find other more cost-effective measures to ensure the same objective and proposes: *"With respect to alternative instruments, a CO_2 tax might be preferable to the EU-ETS in the case of small emitters excluded from the EU-ETS."* EUROPEAN COMMISSION, "*Impact Assessment"*, 31.

828 Article 27, paragraph 1b) of the Consolidated ETS-Directive.

829 FIRST CLIMATE/ECONABILITY, 48.

830 Based on prices of 30 EUR per tCO_2e, the tickets for a short distance flight would raise by 4.6 EUR, the ticket for a long distance flight up to 39.5 EUR. FIRST CLIMATE/ECONABILITY, 82.

831 Article 25a, paragraph 1 of the Consolidated ETS-Directive.

Switzerland has, so far, not taken any adequate measures and Swiss aircraft operators are preparing for compliance as of the first period lasting from 1 January 2012 to 31 December 2012. Intercontinental flights from and to Switzerland are, under the current regulation, not covered by the EU Aviation-Directive.

The EU Commission is now confronted with the risk of European airline operators moving their intercontinental flights to Swiss airports. Likewise, Switzerland may face an increased frequency in intercontinental aviation. This might be welcomed in terms of added value in Switzerland.[832] But the capacity to respond to the increased demand is limited. In addition, increased aviation activity from and to Swiss airports would entail an additional environmental burden for Switzerland.

Due to the imminent risk of dislocation of intercontinental flights to Switzerland (*"carbon leakage"*), it is of high importance to the EU to prevent Switzerland becoming an *"aviation island in the heart of Europe"*. Therefore, it is of high interest of the EU to include Switzerland into the aviation provisions of the EU-ETS.[833] For Switzerland, an incorporation of the EU-ETS aviation provisions may cause some adjustments with non-EU partner and the re-negotiation of bilateral aviation agreements.[834] For Swiss foreign policy, this is a trade-off which has to been decided in the light of the larger framework of bilateral and international relations.

5.4.4 Market Volume and Price of Emission Units

When two Emission Trading Schemes are linked, prices will converge towards the lowest price among significant carbon emitting countries.[835]

Switzerland's overall emissions are insignificant compared with EU's budget.[836] Insignificant is also the market volume of the CH-ETS compared to the EU-ETS's market volume. The current CH-ETS covers about 3 million tCO_2e.[837] In the EU-ETS, the final allocations of emissions units in the cur-

832 INFRAS, 7, calculates an added value of + 0.15 per cent.
833 INFRAS, 66.
834 For the pro and cons of this trade-off see INFRAS, 66.
835 METCALF/WEISBACH, 23.
836 ZUMBACH, 48.
837 The total allocation for the period 2008 to 2012 amounts to 16'346'705 tCO_2e. Calculated on the basis of the NAP of Switzerland, available at <https://www.national-registry.ch/ListePnaq.aspx?Period=01&menu=yes>.

rent phase amounts to almost 2'000 million tCO_2e per year.[838] (Figure 8) The CH-ETS, consequently, equals the size of about 0.15 per cent of the size of the EU-ETS. The enormous difference in volume has consequences on the development of the prices.

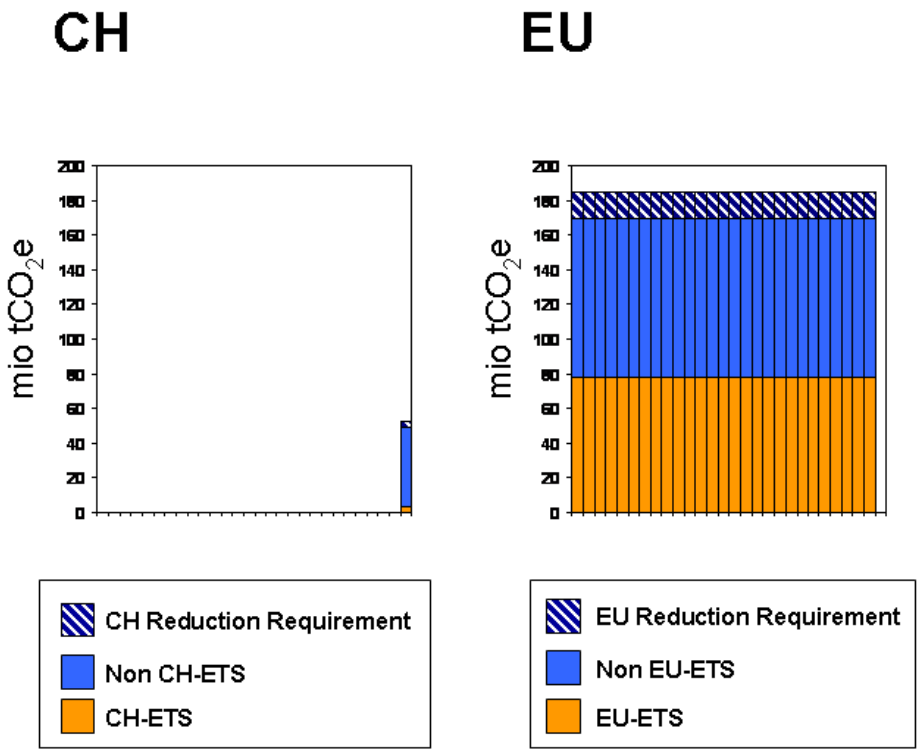

Figure 8: CH-ETS and EU-ETS in Comparison
The CH-ETS covers about 3 million tCO_2e per year. The EU-ETS covers about 2'000 million tCO_2e per year.

In phase I of the EU-ETS, prices increased to over 30 EUR in the middle of 2005. In April 2006, carbon prices in the EU-ETS declined to 15 EUR due to the news that most EU Member States produced fewer tonnes of emissions than allocated. By February 2007, prices fell to less than 1 EUR where they remained for the duration of phase I.[839]

838 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12.
839 ELLERMAN/JOSKOW, 12-15.

In phase II, EU-ETS prices started at around 15 EUR per tCO_2e and increased to almost 30 EUR due to extraordinarily high energy prices up to mid-2008. Since 2008, economic recession has led to fewer emissions and the voluminous supply of offsets from the CDM have led to this year's prices of about 10 to 15 EUR.[840]

In Switzerland, no functioning secondary market for emission units exists so far. On the trading platform established by FOEN in collaboration with the Bernese Cantonal Bank (BEKB), no transaction has been registered.[841] If and how many over-the-counter-transactions have taken place is not known officially.[842] The only transaction known on the Swiss market are the emission units bought by the Climate Cent Foundation. In the first auction round, emission reductions were acquired at price of 70 CHF, in the second auction round at a price of 100 CHF per tonne.[843]

ECOPLAN assumes that, in the case of a linkage, prices in the CH-ETS would drop from an estimated market price of 30 CHF/tCO_2e to 16 CHF/tCO_2e, whereas in the EU-ETS, prices will remain unchanged.[844]

So far, Swiss companies did not have to buy any additional emission units in order to comply with their Target Agreements. From the perspective of a Swiss company, therefore, the option to buy EUAs, even if they may be cheap emission units, is not an attractive argument to promote the idea of a linkage. Even worse: With a linkage to the EU-ETS, Swiss companies may lose the possibility to sell their unused emission units for very attractive prices.

The situation may change with a more stringent cap. If Switzerland commits to 30 per cent emissions reduction versus the 1990 level as foreseen in the popular initiative "*For a healthy climate*" in the case of comparable efforts

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840 GRUBB/BREWER/SATO/HEILMAYR/FAZEKAS, 12. For a complete historical overview over the price development for EUAs see POINTCARBONNEWS, Volume 09, Issue 28, 16 July 2010, available at <http://www.firstclimate.com/uploads/media/CarbonMarketEurope.pdf>.

841 Accessible at <https://www.otc-x.ch/markt/instrument/valor/999999.html>.

842 The author of this thesis knows from informal contacts that there are actors intending to function as an intermediary purchasing and selling CHUs.

843 See <http://klimarappen.ch/en/programmes/target-agreements.html>. About on fifth of the Climate Cent Foundation's total commitments was spent for domestic projects. See NEUE ZÜRCHER ZEITUNG (NZZ), *"Ein Bärendienst für den Klimaschutz"*, 30 March 2011, 26.

844 ECOPLAN, 20. Calculations are based on a static multi-country equilibrium model.

by other emitters, the attractiveness of the large and liquid EU-ETS-market may increase. Swiss ETS-participants may then not be able to achieve the reductions by their own reduction efforts and will have to acquire significantly more emission units from third parties. Unrestricted access to the EU-ETS might then, indeed, be desirable.

For participants in the EU-ETS, in return, a linkage with the CH-ETS will be of very limited interest. Due to the difference of volume, increased liquidity and reduced volatility due to the enlargement of the carbon market is negligible.[845]

If there is no linkage with the EU-ETS, the prices of emission units in Switzerland remain volatile, if existent at all. Whereas the EU-ETS may count on solid price signals due to a liquid secondary market, Switzerland will have to rely on auctions as a price building mechanism in the future.[846]

If there is a linkage with the EU-ETS, the price per emission unit will be determined by market mechanisms. In its study of 2010, ECOPLAN finds that, in the case of a linkage, prices in the CH-ETS would drop to 16 CHF/tCO_2e, whereas in the EU-ETS, prices will remain unchanged.[847]

5.4.5 Quantitative Limits of Offsetting

In the CH-ETS, the CO_2-Act demands that the quantity of offsetting must be *"adequate*".[848] The CO_2-Crediting Ordinance states more precisely that, with regard to Switzerland's commitment on international level, emission reductions achieved abroad may be credited to the reduction target for the years 2008 to 2012 to the extent of a maximum average of 2.0 million tCO_2e per annum.[849]

In the EU-ETS, there was no limit on the use of CERs during the period from 2005 to 2007. For the period from 2008 to 2012, there is a requirement that Member States limit their use of CDM and JI credits in the Kyoto period to a certain proportion of their emission unit allocation, which is to be speci-

845 AEPPLI, 13.

846 FIRST CLIMATE/ECONABILITY, 74.

847 ECOPLAN, 20. Calculations are based on a static multi-country equilibrium model.

848 Article 2, paragraph 7 of the CO_2-Act.

849 Article 5, paragraph 1 of the CO_2 Crediting-Ordinance. Amended in accordance with No. I of the Ordinance of 26 August 2009, in force since 1 November 2009 (AS 2009 4781).

fied by each Member State in its National Allocation Plan (NAP). In the period from 2013 to 2020, installation operators will be able to use either leftover CER and ERU entitlements from the period 2008 to 2012, or an amount corresponding to a certain percentage, which is to be set not below 11 per cent of their cumulated allocation during the period from 2008 to 2012, whichever is the highest.[850] Measures shall also ensure that the total allowed use of credits does not exceed 50 per cent of the mandated reductions.[851]

In Switzerland, there will probably be no admittance of offsets from abroad as of 2013. The National Council, in its deliberations of June 2010, has agreed on a reduction target of minus 20 per cent to be achieved by domestic abatement measures only (*"Inlandkompensation"*). This decision is accompanied by the competence for the Federal Council to increase the reduction target to up to 40 per cent if other major emitters take comparable measures. In this case, only one fourth of the additional reductions must be achieved in-country.[852] In March 2011, the Council of States followed the National Council's decision on the offset-provisions. The Council of States took this decision despite of the opposed recommendation of its Committee for the Environment, Spatial Planning and Energy.[853]

If the decision of a 20 per cent domestic compensation remains in the post 2012-legislation but if Swiss ETS-participants may use EUAs for compliance due to a linkage agreement with the EU, Switzerland would thereby admit the use of CER *"through the backdoor"*. (Figure 9) Since the EU allows the use of CERs for compliance purposes within the EU-ETS, EUAs are freed up to be used for compliance also in Switzerland. Thereby, emissions in Switzerland would indirectly be compensated by offsets from abroad which would be against the provisions as decided by the National Council in June 2010 and the Council of States in March 2011.

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850 Article 11a, paragraph 8, first subparagraph of the Consolidated ETS-Directive.

851 Article 11a, paragraph 8, fourth subparagraph of the Consolidated ETS-Directive.

852 BUNDESAMT FÜR UMWELT (BAFU), "*Das revidierte CO_2-Gesetz nach der Nationalratsdebatte*", 26 July 2010 available at <http://www.bafu.admin.ch/klima/00493/06577/10620/index.html?lang=de>.

853 Press Release of 4 February 2011, "*Mit In- und Auslandmassnahmen 20 Prozent weniger Emissionen*", available at <http://www.parlament.ch/d/mm/2011/seiten/mm-urek-n-2011-02-04.aspx>.

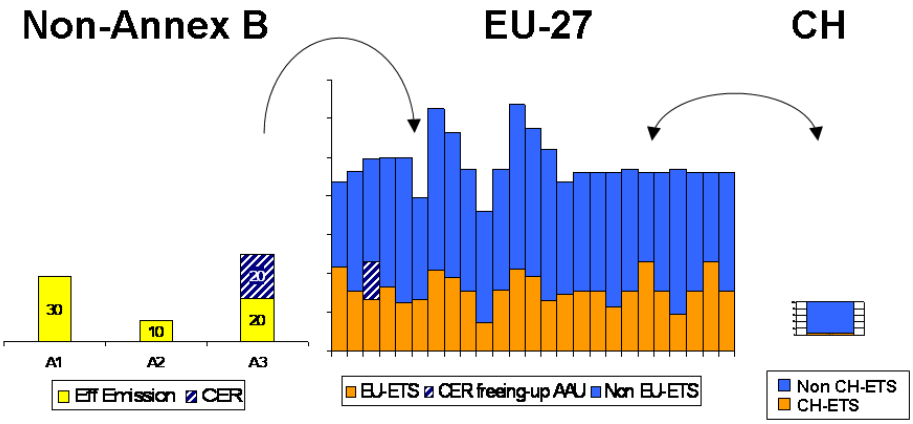

Figure 9: Offsetting from Abroad in a Linked CH-EU-ETS

If Swiss ETS-participants may use EUAs for compliance due to a linkage agreement with the EU, Switzerland would thereby admit the use of CER "*through the back-door*".

5.4.6 Governance Issues in a Linked CH-EU-ETS

The rules for transferring and surrendering emission units in the EU are regulated through the Registry Regulations taking into account the requirements of the Kyoto Protocol. The same applies to the National Registry in Switzerland. A linkage of the registries is therefore considered to be a pure technical issue.

More cumbersome are the provisions regarding monitoring, reporting and verification (MRV). The current provisions of Switzerland regarding the coverage and regarding MRV differ considerably from the respective provisions in the ETS-Directive. The analysis of FIRST CLIMATE/ECONABILITY identifies the need to promote the quality standard of the Swiss MRV-provisions as well as the sector specific technical MRV-requirements in case of a linkage between the CH-ETS and the EU-ETS.[854]

[854] FIRST CLIMATE/ECONABILITY, 39/40.

5.5 Expected Performance of a Linked CH-EU-ETS

Emission trading and linking Emission Trading Schemes is considered to be an instrument to reduce the costs to meet a given emission target. Emission trading was, originally, also introduced as an instrument for environmental protection and the reduction of GHG emissions. Carbon prices and effected emission reductions, hence, may serve as two indicators to assess the performance of a linked CH-EU-ETS. A third indicator in the case of linking domestic Emission Trading Schemes is the welfare on national level.

5.5.1 Carbon Price

Due to the difference of the market volumes, Switzerland would be the price taker and prices for Swiss emission units can be expected to decrease.[855] ECOPLAN assumes that, in the case of a linkage, prices in the CH-ETS would drop to about 16 CHF/tCO_2e, whereas in the EU-ETS, prices will remain unchanged.[856]

With a linkage to the EU-ETS, Swiss companies may buy cheap additional emission units (which they didn't need to buy so far), but may lose the possibility to sell their unused emission units for very attractive prices to the Climate Cent Foundation. For participants in the EU-ETS, increased liquidity and reduced volatility is negligible.[857]

5.5.2 Effected Emission Reductions

None of the studies commissioned by the Swiss authorities on the future CO_2-regime in Switzerland addresses the issue of net emission reductions, neither on national nor on international level. The generally accepted starting point for linking considerations seems to be that the emission reductions achieved in a linked Emission Trading Scheme would be the same as the

855 FIRST CLIMATE/ECONABILITY, 74; AEPPLI, 13.

856 ECOPLAN, 20. Calculations are based on a static multi-country equilibrium model.

857 This assumption is supported by ANGER's finding that linking the EU-ETS induces no or only marginal benefits for the EU as Non EU-ETS sectors, carrying the major compliance burden under the actual allocation regime, would not benefit from a link in the absence of a post Kyoto government trading. ANGER, 2046.

combined emission reductions of the two schemes operating separately.[858] As assumed by HAITES/MULLINS and illustrated by the above mentioned studies, the main motivation for linking seems to be, indeed, usually economic rather than environmental reasons.

As carbon prices in the EU-ETS are cheaper, net emissions in Switzerland are likely to increase with a linkage of the CH-ETS to the EU-ETS. ECOPLAN predicts that whereas emissions reduction effected within the CH-ETS amounts to 6.7 per cent, emissions reductions effected in Switzerland in the case of a linkage with the EU-ETS would decrease to 3.4 per cent.[859]

5.5.3 National Welfare

In the case of a linkage of the CH-ETS to the EU-ETS, about half of the emission reductions requirement of Switzerland will be bought by energy-intensive Swiss entities from participants of the EU-ETS. This reduction requirement corresponds to an estimated value of 3 million CHF.[860] A linkage with the EU-ETS hence entails a capital flow out of country of roughly 3 million CHF. What is the added value Switzerland purchases therefore?[861]

The study conducted by ECOPLAN concludes that, from a Swiss perspective, a linkage of the EU-ETS and the CH-ETS can not be based on the argument of increased well-being.[862] This finding is supported by the analysis of BABIKER/REILLY/VIGUIER showing that international emission trading can even be welfare decreasing because of general equilibrium effects when there are distortions. It occurs in countries exporting emission units when efficiency costs associated with pre-existing distortionary taxes are larger than the primary gains from emission trading.[863]

This theory-based finding is illustrated by the example of Switzerland. According to theory, net buyers in Switzerland would be the winners, net sellers

858 HAITES/MULLINS, 32.

859 ECOPLAN, 20.

860 ECOPLAN, 20.

861 The situation is comparable to a potential link of the EU-ETS to the Emission Trading Scheme in the USA as drafted by the Lieberman-Warner bill. As STERK/MEHLING/TUERK have quantified, such a linkage would lead to significant net purchases by the EU and a net transfer of wealth occurring not due to economic activity but solely as a result of regulation in the USA. See STERK/MEHLING/TUERK, 3.

862 ECOPLAN, 4.

863 BABIKER/REILLY/VIGUIER, 53.

in Switzerland would be the losers in case of a linkage with the EU-ETS. Taking into account that sellers in Switzerland could sell an emission unit at 70 CHF to 100 CHF in the past, and taking into account the fact, that no net buyers in Switzerland have emerged, all the CH-ETS-participants are likely to become losers in the case of a linkage.

From a European perspective, increased well-being is not the argument for a linkage, either. For the EU, a linkage with the CH-ETS is of political interest: As CONNIE HEDEGAARD, present European Commissioner for Climate Action, has revealed when announcing the mandate for negotiations with Switzerland, a linkage with the CH-ETS is interesting for the EU because it signifies a step towards an OECD-wide carbon market.[864] Another reason, not as publicly revealed though not less obvious, is that linking the CH-ETS to the EU-ETS signifies a serious relief of the fears of European airline operators moving their intercontinental flights to Swiss airports.

Summing up, the challenges raised by linking are largely political in nature. The legal and regulatory issues raised by trading across a link, most will usually not follow from the link as such, but from the general operation of the underlying carbon markets within general law.[865]

The widespread argument that a link of the CH-ETS with the larger EU-ETS is attractive for Swiss ETS-participants because it opens doors to a larger and more liquid market is, in theory, correct.[866] In practice, however, it must be considered very carefully whether the EU-ETS, though larger and more liquid, will in fact be attractive for Swiss ETS-participants and whether a linkage with the EU-ETS would, after all, hit Switzerland's climate policy targets in real terms.

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864 RENÉ HÖLTSCHI, *„Gespräche über Emissionshandel"*, in: Neue Zürcher Zeitung (NZZ), 21 December 2010. "*Bei der Beantragung des Verhandlungsmandats im November erklärte die EU-Klimaschutzkommissarin Connie Hedegaard, die Verknüpfung mit dem Schweizer System sei ein weiterer Schritt in Richtung eines OECD-weiten Marktes für Emissionshandel, der später auch fortgeschrittenere Entwicklungsländer einschliessen könne.*"

865 MEHLING, 118.

866 See for example RENÉ HÖLTSCHI, *„Gespräche über Emissionshandel"*, in: Neue Zürcher Zeitung (NZZ), 21 December 2010: *"Für die Schweiz und ihr Unternehmen wäre eine Verknüpfung der beiden ETS attraktiv, weil der Emissionshandels-Markt der EU viel grösser und damit liquider ist als der Schweizer Markt. Zudem hätten sie beim Erwerb oder Verkauf von Emissionsrechten gleiche Bedingungen wie ihre EU-Konkurrenten."*

6 Conclusion

6.1 The International Climate Policy Framework

Climate change is one of the greatest challenges of our time. In order to halt the increase in global temperature, deep cuts in global emissions are required. Almost two decades ago, the United Nations Framework Convention on Climate Change (UNFCCC) planted the seed to what has become the Kyoto carbon market. The basic objective of the Convention is to stabilize greenhouse gas (GHG) emissions at a level that would prevent dangerous interference with the climate system. The Convention, however, does not specify the necessary reduction level nor does it create any legally-binding obligations to limit GHG emissions. The major importance of the Convention for the international climate change framework consists of the fact that it provided an objective, as well as basic principles.

It was with the Kyoto Protocol, adopted by the third *"Conference of the Parties*" (COP) to the Convention on 11 December 1997, that binding commitments have been agreed for those Parties which are listed in Annex B of the Kyoto Protocol. The way to achieve compliance with its Kyoto commitment is up to each Party. Emission trading is one possible instrument. But there are other instruments such as taxes, charges and subsidies.[867] If and to what extent the Annex B-Parties integrate the market-based flexible mechanisms provided for in the Kyoto Protocol into their national instruments is up to each Party.

The carbon market is not uncontested mainly because of the issues of supplementarity and additionality. Supplementarity is intended to preclude countries and companies from counting on the flexible mechanisms to bypass their national reduction targets. Additionality ensures that a project is implemented in addition to what would have been done without the flexible mechanisms. Especially the Clean Development Mechanism (CDM) is subject to a lot of critical literature and research. The issues are, on the one side, its onerous administrative requirements and the complex procedures. On the other side, the criticism targets the environmental integrity of the CDM and questions the capacity to produce real, measurable and long-term benefits to avoid climate change. The difficulties of the CDM arise from the asymmetry

867 WEBER, 2011, 51-59.

in the concept: CERs, the certified emission reductions originating from a CDM-project, may contribute to reach the reduction target of the Annex B-Party where the purchasing installations originates from. But CERs do not correspond to a transfer of an assigned amount because the host country of the CDM project, by definition a Non-Annex B-Party, has not committed to any emission reduction target under the Kyoto Protocol and, therefore, has no assigned amount at its disposal. The assigned amount of the CER-purchasing Annex B-Party hence remains equally elevated in spite of the compensation effected elsewhere by transferring CERs. Consequently, each CER imported into the registries of an Annex B-Party represents additional emissions and, contrary to the emission trading's environmental objective, an increase of the worldwide overall emission cap.

To counter the criticism, the negotiators in Kyoto intended to create a strong compliance regime in order to preserve the environmental integrity of the carbon market. Supporters of the Kyoto Protocol highlight the fact that the UNFCCC represents the only international instrument to limit GHG emissions which is legally binding. An Annex B-Party not fulfilling its reduction commitment will have to face a deduction from the Party's assigned amount for the second commitment period of a number of tonnes equal to 1.3 times the amount in tonnes of excess emissions. On closer examination, however, this mechanism is not an efficient tool. The fact that there is no agreement on commitments for the next period makes the deduction approach to be not enforceable – because the substantial deduction of tonnes of a Party's assigned amount in a subsequent commitment period does not hurt if there is no subsequent period.

The Climate Change Summit in Copenhagen in 2009 was expected to produce an agreement on further commitments for developed countries within the framework of the Kyoto Protocol. However, no such agreement was reached in Copenhagen and serious concerns about a potential gap between the first and subsequent commitment periods under the Protocol came up.[868] Meanwhile, the Conference on Climate Change in Cancun in 2010 has restored trust in the international negotiations. Yet, the Conference on Climate Change in Durban in the end of 2011 will unlikely close this serious loop-

[868] TORNEY/FUJIWARA, 3; HEUBERGER, 839; BOISSON DE CHAZOURNES, 808; See also GERD KOLBE, *"Die Klimapolitik dreht sich im Kreise"*, in: Neue Zürcher Zeitung (NZZ), 17 June 2011, available at <http://www.nzz.ch/nachrichten/politik/international/die_klimapolitik_dreht_sich_im_kreis_1.10958936.html>.

hole in the concept of the Kyoto carbon market. The global carbon market will probably have to cope with a so-called *"post-Kyoto gap"*.

6.2 The Emission Trading Scheme of the European Union

The Emission Trading Scheme of the European Union (EU-ETS) is the largest and most advanced Emission Trading Scheme worldwide. It functions independently from the Kyoto carbon market, yet it is indirectly linked to the Kyoto carbon market by the acceptance of emission units from CDM- and JI-projects. In 2010, emission units of the EU-ETS accounted for 84 per cent of the global market value.[869]

During the negotiations of the Kyoto Protocol, the EU and its Member States opposed the introduction of any market-based flexible instruments into the international climate regime. Nevertheless, in order to ensure that the Kyoto Protocol would enter into force, the EU conceded, and agreed to the market-based mechanisms of the Kyoto Protocol. By setting up a legal framework in very short time, the Emission Trading Scheme of the EU was able to take up operations even before the start of the first Kyoto commitment period. In order to increase the cost-effectiveness of achieving the Community emission reductions target, linking the Community scheme to GHG Emission Trading Schemes in third countries was foreseen since its inception.

In the so-called "*Burden Sharing Agreement*", the European Community and its Member States agreed to fulfil their Kyoto Protocol-commitments *"jointly*". The overall commitment of emission reductions of 8 per cent was redistributed by giving some Member States such as Luxembourg, Germany, Denmark and others a reduction requirement of more than the average of 8 per cent, whereas Member States such as Portugal, Greece and others are allowed to even increase their greenhouse gas emissions above their 1990 emission levels.

The EU-ETS was adopted by way of a Directive which had to be transposed into national law by each EU Member State. In 2007, the EU-ETS Directive was incorporated into the *"European Economic Area Agreement"* (EEA Agreement), linking Norway, Liechtenstein and Iceland to the EU-ETS as of

869 WORLD BANK, 2011, 9.

1 January 2008. The current EU-ETS may consequently be considered as a system of 30 largely independent, but inter-linked national Emission Trading Schemes, which have agreed to make their emission units tradable within the EU-ETS while adhering to certain common EU rules, procedures, guidelines and criteria.[870]

The performance of the EU-ETS is generally perceived as positive in so far as a carbon price is successfully established. A significant segment of the European industry is incorporating the price of CO_2 emissions into their daily production decisions.[871] The volatility of the price, however, was extreme in the past.[872] Instruments to reduce volatility would be helpful and first measures have been taken by more generous banking provisions.

Yet, the EU-ETS is not pulling its weight. In terms of effected emission reductions, the performance of the EU-ETS is considered to be unsatisfying.[873] The main cause is the different approaches to allocation adopted by the Member States in phase I and phase II of the EU-ETS and the resulting lenient over-all cap of the EU-ETS.[874]

Until the situation of surplus emission units in the EU-ETS is resolved, the pressure on energy-intensive companies to reduce emissions will remain low, as will carbon prices. More than half of the GHG emissions in the EU are not covered by the EU-ETS and must be reduced in Non EU-ETS sectors. If the EU-ETS cap is set on a non-ambitious level, it is up to the Non EU-ETS sectors to make up the difference in order to reach the Kyoto reduction target.

With the harmonized allocation rules of Directive 29/2009/EC, the first step into the direction of a more solid performance is taken. Still, the problem of too many emission units allocated remains. And new challenges are ahead.

The inclusion of aviation expanding the volume of the EU-ETS by about 10 per cent as of 1 January 2012 bears considerable uncertainty. Firstly, third country airlines claim that the inclusion of these airlines into the EU-ETS is

870 POHLMANN, 343; ELLERMAN/JOSKOW, 4.

871 ELLERMAN/JOSKOW, iii.

872 See WEBER/DARBELLAY, 275, explaining the extreme volatility with the fact that the carbon market is very young. Time and more certainty about its futures prospect should, according to WEBER/DARBELLAY, lend it the credibility needed to achieve a certain degree of market stabilization.

873 SANDBAG, 11.

874 KAMINSKAITE-SALTERS, 326.

illegal under international law because it is an extra-territorial application of EU policy on non-EU carriers and an improper tax or charge contradicting the provisions of the Chicago Convention and of the Kyoto Protocol. Even if the opinion of the European Court of Justice (ECJ), released on 6 October 2011, suggests that the EU's plan to extend the ETS to aviation does not interfere with the sovereignty of third countries and complies with all relevant aviation agreements, the final word as not been spoken yet.

Secondly, there is an asymmetry in the concept. The Aviation-Directive gives aircraft operators full access to the EU-ETS. Stationary installations covered by the EU-ETS, however, are not allowed to use aviation emission units for compliance purposes. This may, on the one hand, increase the worldwide overall emission cap.[875] On the other hand, the asymmetry in the concept of aviation as an additional sector in the EU-ETS increases the risk of carbon leakage: If energy-intensive ETS-sectors have to cope with an increased demand for EUAs, they may consider to relocate production to countries outside the EU.

6.3 The Emission Trading Scheme of Switzerland

The Emission Trading Scheme of Switzerland, like the EU-ETS, exists independently from the Kyoto carbon market. And like the EU-ETS, the CH-ETS is also linked to the Kyoto carbon market by the acceptance of emission units from CDM- and JI-projects. But there are serious disparities between the two Emission Trading Schemes. Firstly, the scheme in Switzerland equals only the size of about 0.15 per cent of the size of the EU-ETS. Secondly, the history of the Swiss system has produced a deviating concept. Being a result of a complex search for a political compromise, the CH-ETS is a system based on voluntary measures which offers incentives for self-

875 If an entity currently covered by the EU-ETS successfully reduces its emissions by one tonne of CO_2, it can sell one EUA to an aircraft operator which would now acquire the right to emit one tonne of CO_2. However, because aviation falls outside the scope of the Kyoto Protocol, an AAU cannot be transferred alongside the EUA, which would leave the Member State of the installation that sold the EUA with one spare AAU. The AAU could be allocated to a Non EU-ETS-entity, which could now emit one tonne of CO_2. As a result of the transaction, a reduction in emissions of CO_2 by one tonne by the original installation would have the effect of allowing the emission of two tonnes of CO_2 – one by the aircraft operator, and one by a Non EU-ETS entity within the Member State. See KAMINSKAITE-SALTERS, 332.

regulation, representing thus an element of a changing relation between state and individuals.

The main characteristic of the Swiss emission trading concept is the direct link with a steering fee on fossil fuels. The CO_2-Act offers companies the option to bindingly commit to emission reduction targets and thereby to participate in the CH-ETS in order to get exempted from paying the CO_2-Fee. For Non ETS-companies, the CO_2-Fee currently constitutes a kind of a tax. For ETS-companies, on the contrary, the exemption from the CO_2-Fee is the key incentive to participate in the CH-ETS. At the same time, the CO_2-Fee is the central compliance instrument of the current CH-ETS since a non-compliant company has to pay back the redistributed CO_2-Fee inclusive interests. With the proposed but not yet agreed Draft CO_2-Act, emission trading in Switzerland will become a self-contained instrument independent from the CO_2-Fee as it is already the case in the EU.

With regard to the Draft CO_2-Act to be concluded by 29 August 2012, the issue of supplementarity is intensively discussed in Switzerland these days. According to the current state of parliamentary decisions, offsets from abroad will probably not be admitted as of 2013.[876]

If regulation provides for a 20 per cent domestic compensation by 2020 in the post 2012-legislation but if Swiss ETS-participants are allowed to use EUAs for compliance due to a linkage agreement with the EU, Switzerland would thereby admit the use of CER *"through the backdoor"*. Since the EU allows the use of CERs for compliance purposes within the EU-ETS, EUAs are freed up to be used for compliance also in Switzerland. Thereby, emissions in Switzerland would indirectly be compensated by offsets from abroad which would be against the supplementarity-provision as decided by the National Council in June 2010 and the Council of States in March 2011.

It must be acknowledged: Even if market activity is lower than expected, the Swiss Emission Trading Scheme exists. But it has neither produced a true market price nor has it prevented Switzerland from missing its reduction targets.

[876] This is only the case for the „*mandatory*" market of the CH-ETS. On voluntary basis, emission units from CDM projects may always be purchased as it is often done for reputational reasons.

Of course, the current CH-ETS is a complicated result of a complex search for a political compromise.[877] As it was the case with the EU-ETS, the primary goal of a trial phase must be to develop the infrastructure and to provide the experience to enable the successful use of a cap-and-trade system to limit GHG emissions in Switzerland during the next compliance period. From this perspective, the CH-ETS is a success.

The ETS being only a little piece in the puzzle of the comprehensive Swiss climate policy, the missed reduction target is not the result of a lack of effectiveness in the CH-ETS. The surplus of emissions in Switzerland is, first and foremost, due to the idleness within the Non CH-ETS sectors, namely transport.

6.4 Linking Emission Trading Schemes

The enlargement of carbon markets by the linkage of domestic Emission Trading Schemes has been discussed especially since about 2006 when the emergence of Emission Trading Schemes in various regions of the world seemed to be realistic and transatlantic links appeared to be a promising option. In theory, linking distinct Emission Trading Schemes will increase efficiency by taking advantage of the diversity of sources. The diversity of sources entails a diversity of costs for emission reduction actions in the larger linked system, thus reducing the overall abatement costs and delivering a common environmental goal at least-cost.[878]

The pilot period of the EU-ETS has demonstrated that linking itself changes the rules of the game. Linking promotes the concept of offsetting with emission units from abroad and makes additionality to be a major concern. The environmental integrity of the concept is only preserved if emission units are given exclusively to projects that have been developed "*in-addition-to-what-would-have-been-done*" without the offsetting option. In addition, enlarging a trading scheme by a linkage will give participating states an incentive to relax their cap in order to become net sellers. Altered incentives for cap-setting, questions of competitive distortions, distributional implications and

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877 ZUMBACH, 57, adding that legislation as a result of a democratic process, in particular in Switzerland, seldom ends up in perfect legislation.

878 BARON/PHILIBERT, 123; ELLIS/TIRPAK, 9; HAITES/MULLINS, 1; KRUGER/OATES/PIZER, 119. Transactional costs and administrative expenses in an ETS, however, are significantly higher than in a command-and-control system. WINTER, 297.

(legitimate) national concerns end up in making reality *"second best"*. Fears that the complexity of linked Emission Trading Schemes leads to more global emissions must be considered seriously.

While linking may still result in an overall reduction of costs, it does, however, not mean that everyone is better off. Despite possible overall cost savings due to linking some participants of each of the linked programs are likely to be financially disadvantaged as a result. What may be beneficial to individual trading entities may not result in a net benefit for the country and in effect to the climate. In the case of a linkage of the CH-ETS to the EU-ETS, about half of the emission reductions requirement of Switzerland will be "*effected*" by energy-intensive Swiss entities acquiring EUAs from operators in the EU-ETS. This reduction requirement corresponds to an estimated value of 3 million CHF.[879] A linkage with the EU-ETS hence entails a capital flow out of country of roughly 3 million CHF. In addition, Swiss ETS-participants will not have any incentives any more to strive for surplus emission units and to effectively reduce their emissions. Firstly, cheap emission units can be bought on the enlarged CH-EU market. Secondly, selling surplus emission units is not attractive any more because the prices of emission units drop. This is contrary to the emission trading's objectives of preserving environmental integrity by giving carbon a price and by fostering new technologies. However, the possibility that, contrary to theory, emission trading and the linkage of Emission Trading Schemes might be welfare decreasing in some cases has not been generally appreciated in the environmental economics literature so far.[880]

Climate change policy becomes ever more complex. Or, to use the words of an expert of the Swiss system: The complexity of the carbon market hits "*the limit of what is reasonably acceptable*".[881] This complexity bears risks such as redundancy and conflicting economic versus ecological targets. But it also brings along the risk of no participation in the market because it simply is too complex to be manageable. To determine the adequate balance between regulation and efficiency is an immense challenge – and an urgent priority.[882]

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879 ECOPLAN, 20.

880 BABIKER/REILLY/VIGUIER, 34.

881 HILDESHEIMER, 49: „*Die Umsetzung dieses Systems ist heute an der Grenze der Zumutbarkeit in Sachen Komplexität (...) Perfektion, die nicht umsetzbar ist, führt nicht zum Ziel.*"

882 WEBER/DARBELLAY, 277. With regard to the CDM, they consider the adequate balance of divergent interests to be achieved when market participants are driven by competitive

Yet, there are arguments in favour of a linkage of the Emission Trading Scheme of Switzerland to the Emission Trading Scheme of the EU. Firstly, a linkage is a sign of commitment to combat climate change on an international level. Indeed, as it is advocated by various commentators, international climate policy may be continued through a collection of bottom-up linkages serving as a natural starting point in negotiations leading to a top-down agreement.[883] A system of linkages may help to develop the experience, mutual confidence and credibility necessary for global negotiations to succeed. Linking the CH-ETS to the EU-ETS may, therefore, be politically adequate to serve as a signal of commitment. Secondly, a linkage of the CH-ETS to the EU-ETS may contribute to promoting planning reliability, and thus reduce competitive distortion arising from uncertainty. Market activities in the yet very quiet Swiss carbon market are likely to increase.

Emission trading per se, however, is not the only and not the most effective instrument to combat climate change. Having regional carbon regimes with differing instruments rather than an unified global carbon regime does not matter if the price of carbon is the same across regions.[884] A pragmatic combination of various policies such as tax, subsidies, command-and-control policies and voluntary measures to promote climate friendly technologies on the one hand and measures to steer consumers' behaviour on the other hand seems to be a promising further research field.[885]

pressure and when regulation does not privilege any market participants to the detriment of others.

883 For example JAFFE/RANSON/STAVINS, 803. See also BOISSON DE CHAZOURNES, 808: "*Il semble de plus en plus qu'une nouvelle approche s'esquisse. Elle reposerait sur une démarche de "nationalisation" des actions à mener et se départirait de trop de contraintes internationales. Ce serait une approche "bottom up" et non plus une approche "top down"*.

884 METCALF/WEISBACH, 4: *"For example, one region might have a tax and another a cap and trade system; as long as the permit price is roughly in parity with the tax rate, the results will be similar to a global regime in that only the most efficient mitigation options will be pursued."* On innovative taxation strategies see WEBER, 2011.

885 WINTER, 298; See also KRUGER/OATES/PIZER, 131.